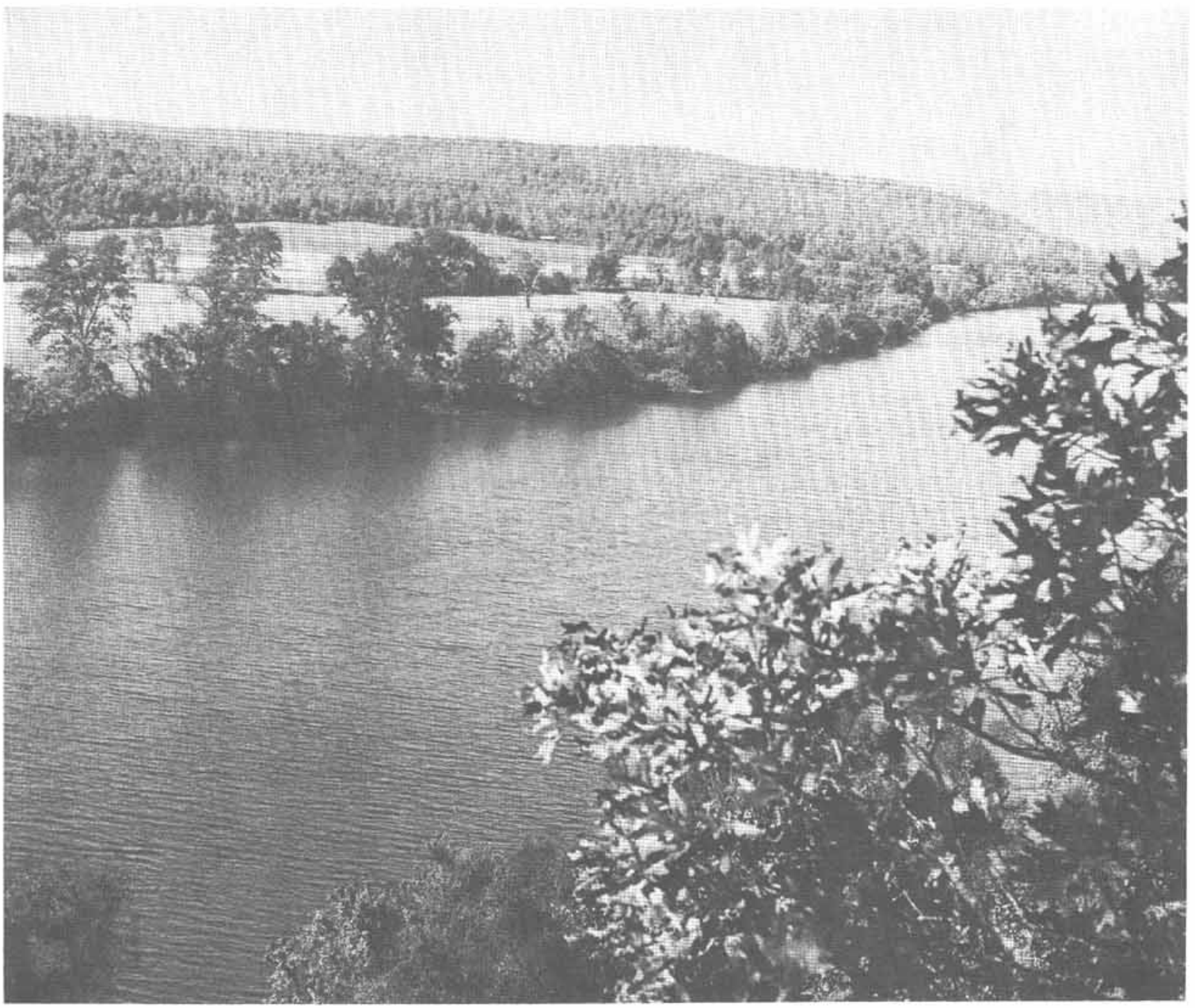
United States
Department of
Agriculture

Soil
Conservation
Service

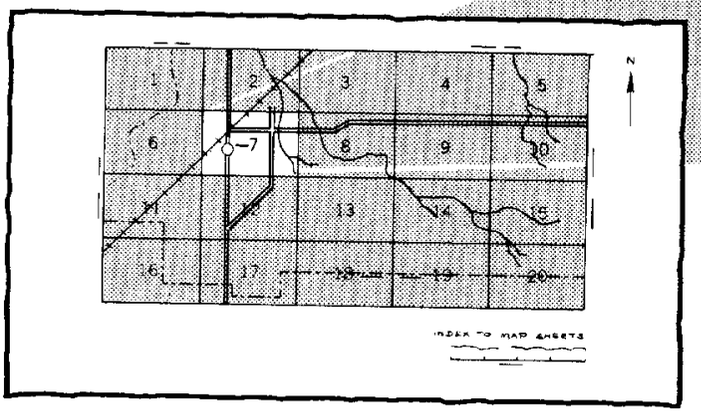
In Cooperation with
Arkansas Agricultural
Experiment Station

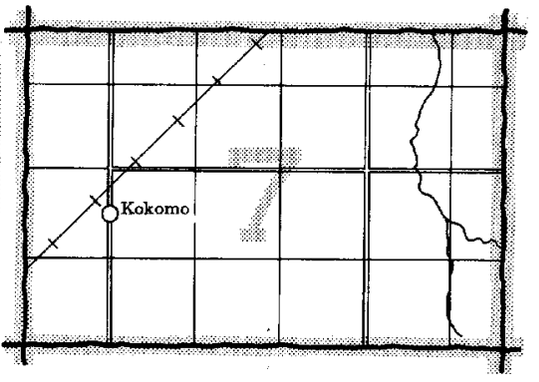
Soil Survey of Independence County Arkansas



HOW TO USE

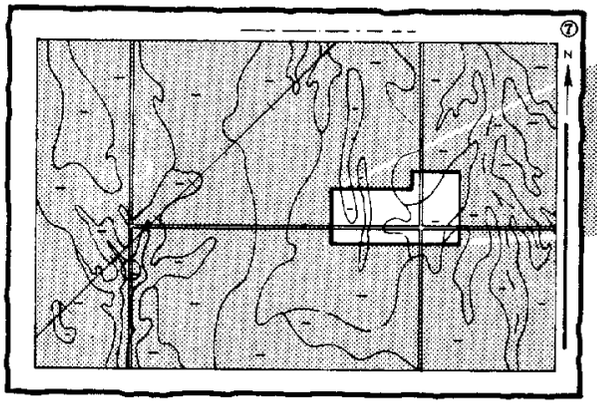
1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).

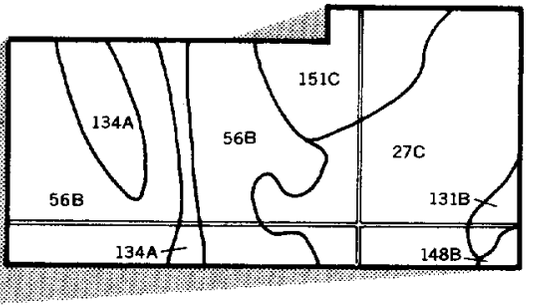




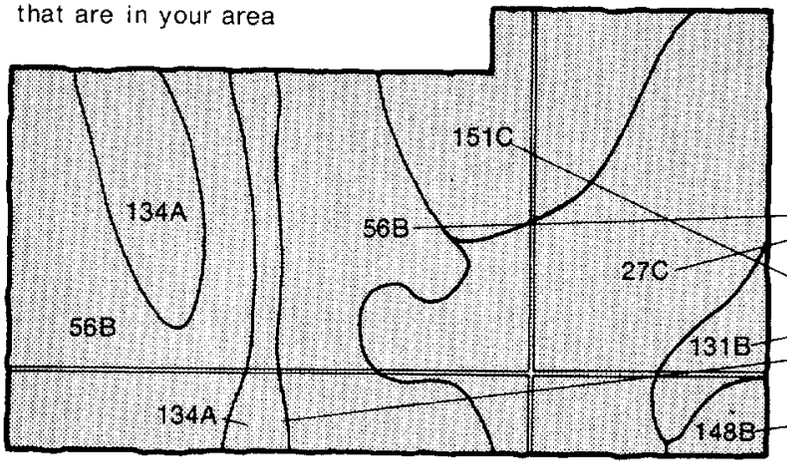
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.





4. List the map unit symbols that are in your area



Symbols

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56B
131B
134A
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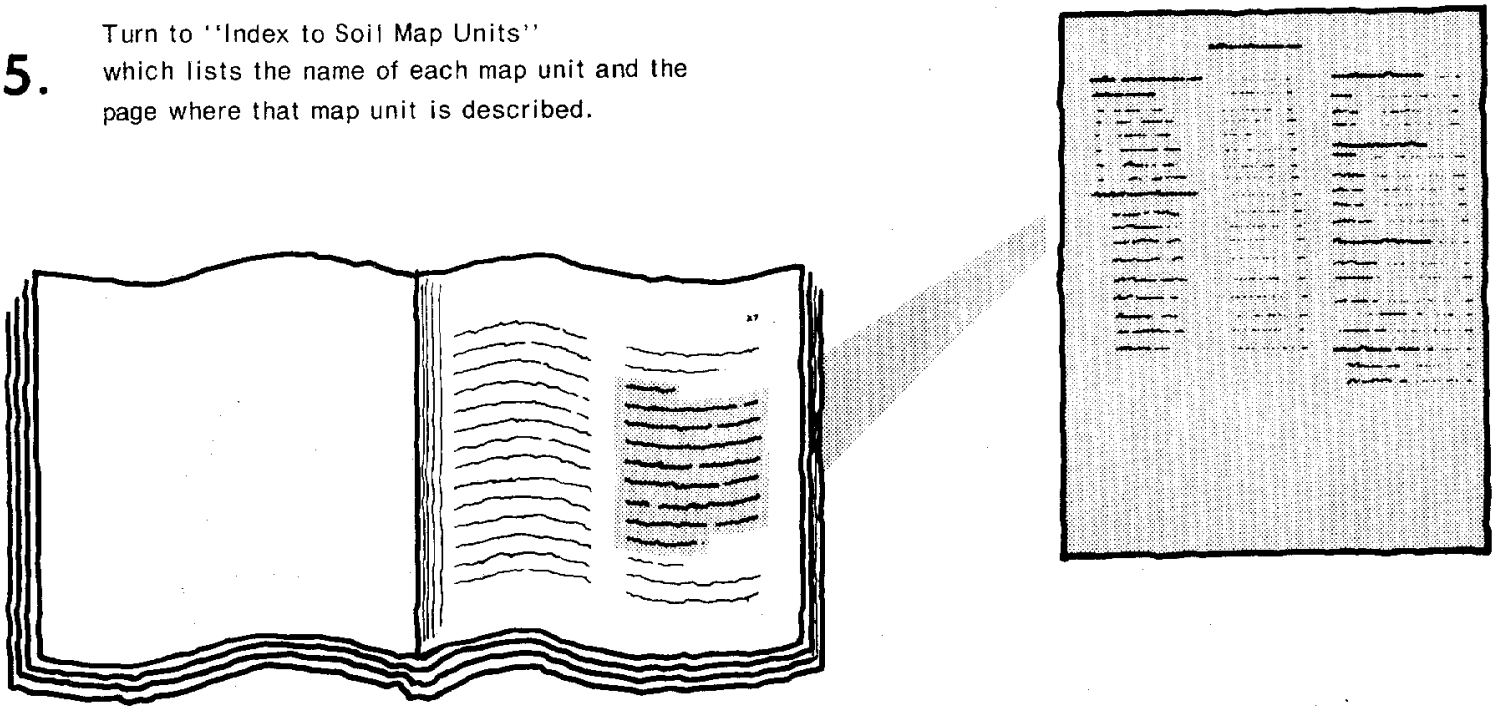
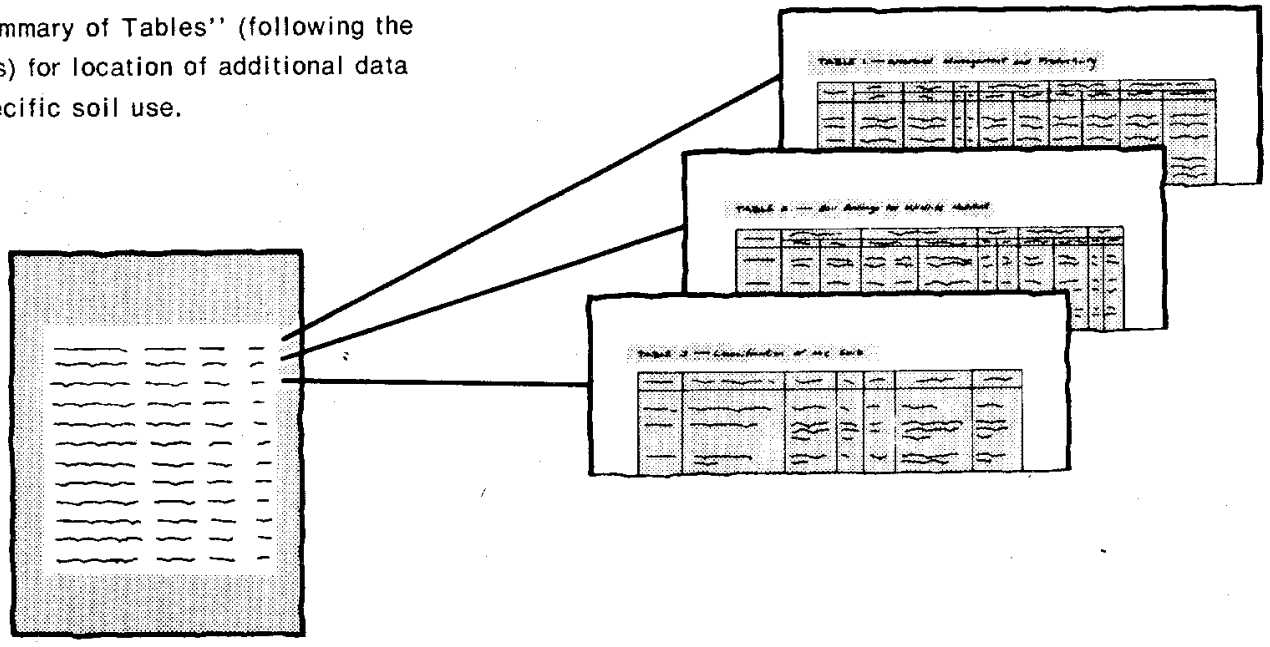
151C

THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; for specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was performed in the period 1975-80. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1980. This survey was made cooperatively by the Soil Conservation Service and the Arkansas Agricultural Experiment Station. It is part of the technical assistance furnished to the Independence County Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: The White River is the major stream in Independence County. Sturkie and Wideman soils are on the flood plains, and Enders, Linker, and Mountainburg soils are on the uplands.

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Issued December 1982

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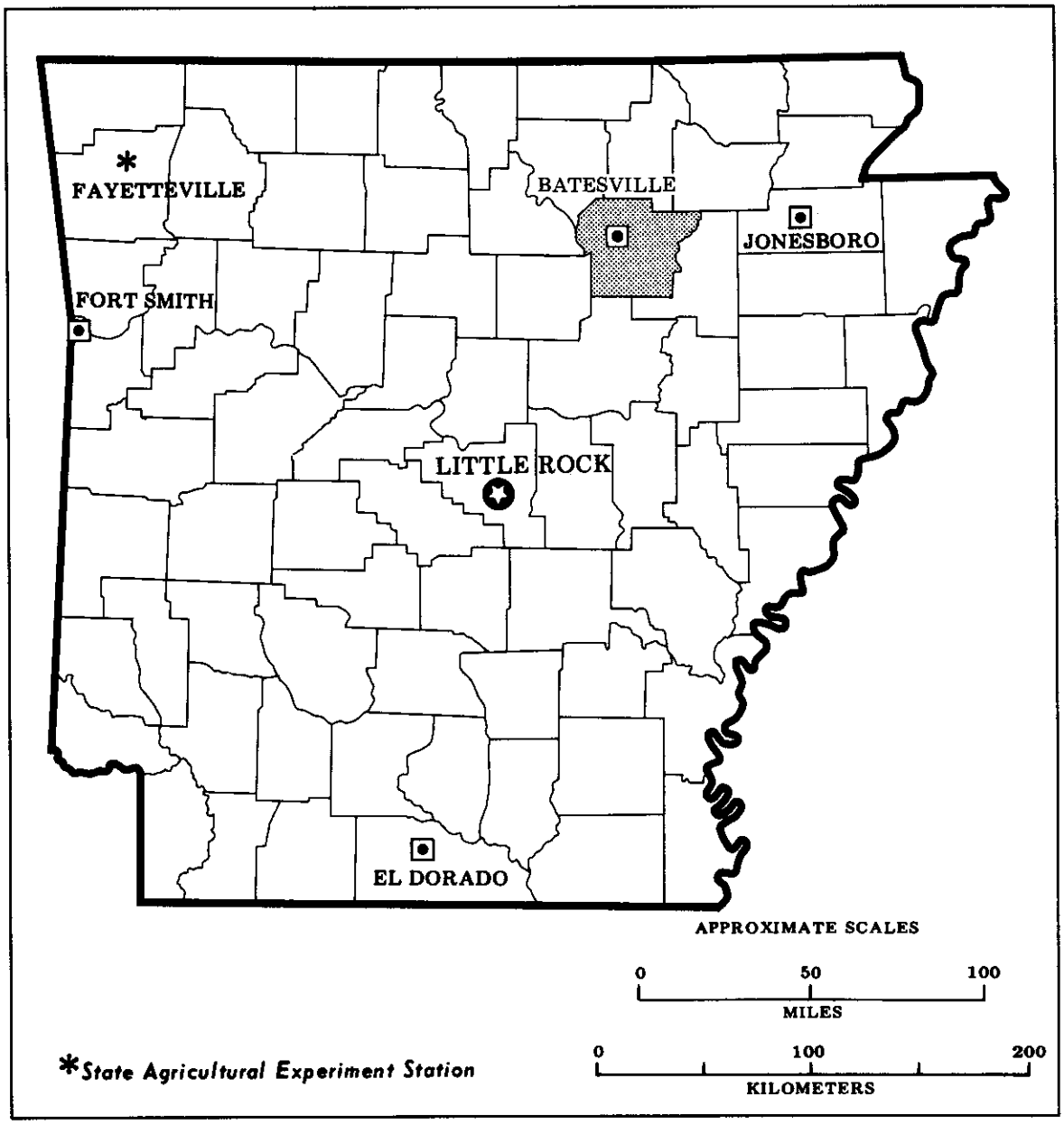


Location of Independence County in Arkansas.

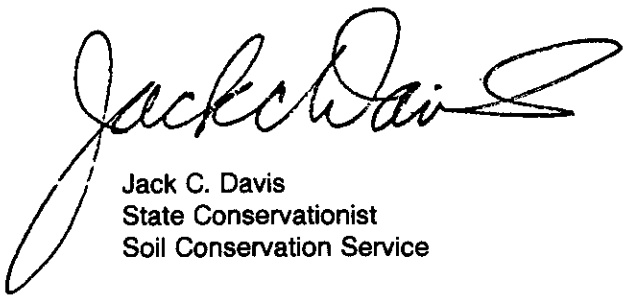
foreword

This soil survey contains information that can be used in land-planning programs in Independence County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.



Jack C. Davis
State Conservationist
Soil Conservation Service

soil survey of
Independence County, Arkansas

By Dick V. Ferguson, J. Sidney Lowrance, and Clarence E. McFadden,
Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service
in cooperation with Arkansas Agricultural Experiment Station

INDEPENDENCE COUNTY is in northeastern Arkansas. It is roughly square and is about 29 miles from north to south and about 32 miles from east to west. The county is bounded on the east by Jackson County, on the south by Jackson and White Counties, on the west by Cleburne, Stone, and Izard Counties, and on the north by Sharp and Lawrence Counties. The total area is about 486,400 acres, or 760 square miles, which includes 5,184 acres of large bodies of water.

In 1970, the population of Independence County was 22,723. Batesville, the county seat and main trading center, had a population of 7,209. The economy of the area is based on farming. Except for a few manufacturing plants in and near Batesville, most of the businesses provide farm services.

Uplands make up about 80 percent of the county. They are in the northern, western, and southern parts of the county. The soils on the uplands formed mainly in residuum of moderately hard to hard sedimentary rock. These soils are low in plant nutrients. The soils in about half of the upland areas are suited to use as cropland or pasture. However, erosion is a moderate to very severe hazard. In the other areas the soils are either too steep or too stony for intensive use. They are used as woodland.

Flood plains and terraces make up 20 percent of the county. They are along the Black River in the eastern part of the county and along the White River, which flows from west to east through the middle of the county. The soils on flood plains and terraces formed in alluvial sediment and are moderate to high in plant nutrients. They are suited to farming and, except for those in a few wooded tracts, are used for cultivated crops. Excess water drains slowly or ponds and is a moderate to severe hazard in most areas. Erosion is a hazard in a few areas.

Dams on the upper White River have made flooding along this river negligible. Flooding along the Black River occurs frequently late in winter and early in spring. However, the flooded soils generally dry early enough for a warm-season crop to be grown.

Elevation above mean sea level ranges from 210 feet in the southeastern corner of the county along Departee Creek to about 1,200 feet at Brock Mountain near the western border.

general nature of the survey area

This section discusses farming, physiography and drainage, and climate in Independence County. Statistics in the discussion of farming are from the 1974 Census of Agriculture and the Annual Agricultural Statistics for Arkansas.

farming

The early settlers in Independence County cleared and cultivated the soils on natural levees above the flood plains of rivers and on broad ridgetops and plateaus in

the southern part of the county. These soils had good natural drainage. They were used mainly for cotton. The soils that were steep, stony, or wet were left as woodland.

Farming is still the principal means of livelihood in the county. Cotton has declined in importance, and soybeans and small grains have increased in importance. Corn and other feed crops also have declined in importance. Table 1 shows the acreage of the principal crops in 1973 and 1978.

On the bottom lands, soybeans have replaced cotton as the principal crop. Wheat, rice, grain sorghum, and corn are also grown. Some beef cattle are raised, and catfish are raised commercially by some farmers.

On the uplands, pasture and hay for forage have replaced cotton. Beef cattle, dairy cattle, swine, chickens, and timber provide most of the farm income. Some farmers grow strawberries, melons, and other truck crops. There are also several commercial peach and apple orchards.

The number of beef cattle and dairy cattle in the county has been decreasing for several years. Table 2 gives the number of livestock and poultry in the county in 1974 and 1979.

Between 1969 and 1974, the number of farms in Independence County decreased from 1,115 to 1,013, and the average size of a farm increased from 257 acres to 285 acres.

physiography and drainage

The major geological deposits at or near the surface in Independence County are sedimentary bedrock, alluvium, and loess. Sedimentary bedrock underlies most of the uplands north of the White River and all of the uplands south of the White River. Alluvium makes up the bottom land of the White and Black Rivers. Loess overlies a strip of uplands that runs southwest to northeast along the Black River bottom lands. Residuum and colluvium from sedimentary bedrock, alluvium, and loess are the parent materials of the soils in the county.

Sedimentary bedrock in most areas north of the White River is limestone, chert, and siltstone. In some places, it is sandstone and shale. Sedimentary rock in most areas south of the White River is sandstone and shale. In some places, it is limestone. The alluvium varies in thickness, but generally it is more than 50 feet thick. The underlying material is unconsolidated sediment that also varies in thickness. The loess generally is 2 to more than 10 feet thick, and it overlies unconsolidated old-alluvium, Coastal Plain sediment, or residuum of sedimentary bedrock.

Independence County includes parts of three physiographic provinces. These are the Mississippi Alluvial Plain section of the Coastal Plain province, the Arkansas Valley section of the Ouachita province, and the Boston Mountains section and the Springfield-Salem Plateaus section of the Ozark Plateaus province.

The landscape of the Ozark Highland area, north of the White River, is characterized by narrow ridges and valleys and steep side slopes that have a few benches. On the ridges, slopes are dominantly 12 to 40 percent. Along valley drainageways, slopes are generally less than 3 percent.

The Boston Mountains and Arkansas Valley areas south of the White River, are characterized by rounded hills and mountaintops, undulating plateaus, moderately steep to very steep side slopes, and broad valleys. On the hills and mountains, slopes are predominantly 12 to 45 percent; and on the plateaus and valleys, slopes are 1 to 8 percent.

The bottom lands of the Mississippi Alluvial Plain range from broad flats to areas of alternating swales and low ridges. Except along a few streambanks, local differences in elevation are minor. Slopes are generally less than 1 percent, although they are as much as 3 percent on the sides of some low ridges.

The loess uplands of the Mississippi Alluvial Plain are characterized by gently sloping to moderately sloping areas and nearly level to gently sloping terraces and valleys. Slopes range from 1 to 12 percent; they are predominantly 3 to 8 percent.

Polk Bayou, Curia Creek, Black River, and Dota Creek drain the northern part of the county. Saldo Creek, Greenbrier Creek, and Departee Creek drain most of the southern part. All of the county drains into the Mississippi River through the White River. However, the southwestern part of the county drains into the Little Red River before entering the White River.

On the uplands, ground water is insufficient for large-scale irrigation. Dug wells, drilled wells, and ponds supply most of the domestic water. Drilled wells are the most dependable source of drinkable water. The water is generally hard. Most of the wells are less than 200 feet deep, although some are as much as 700 feet deep. Ponds and creeks supply most of the water for livestock.

On the bottom lands, ground water is in good supply. Wells 12 inches in diameter, drilled to a depth of 100 to 150 feet, yield about 1,500 to 1,800 gallons per minute of fair to good quality water for irrigation.

climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Independence County is hot in summer, especially at the lower elevations, and moderately cool in winter, especially in the mountains and high hills. Rainfall is fairly heavy and well distributed throughout the year. Snow falls nearly every winter.

Table 3 gives data on temperature and precipitation for the survey area as recorded at Batesville, Arkansas, in the period 1951 to 1978. Table 4 shows probable dates of the first freeze in fall and the last freeze in

spring. Table 5 provides data on length of the growing season.

In winter the average temperature is 40 degrees F, and the average daily minimum temperature is 29 degrees. The lowest temperature on record, which occurred at Batesville on February 2, 1951, is -15 degrees. In summer the average temperature is 78 degrees, and the average daily maximum temperature is 92 degrees. The highest recorded temperature, which occurred on July 13, 1954, is 112 degrees.

Growing degree days are shown in table 3. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 50 inches. Of this, 25 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 18 inches. The heaviest 1-day rainfall during the period of record was 5.04 inches at Batesville on November 4, 1959. Thunderstorms occur on about 60 days each year, and most occur in summer.

The average seasonal snowfall is 7 inches. The greatest snow depth at any one time during the period of record was 9 inches. On an average of 3 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 70 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 9 miles per hour, in spring.

how this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map units" and "Detailed soil map units."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, woodland managers, engineers, planners, developers and builders, home buyers, and others.

general soil map units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The soils in the survey area vary widely in their potential for major land uses. Soil suitability ratings in the descriptions that follow are based on the practices commonly used in the survey area to overcome soil limitations. These ratings reflect the ease of overcoming the limitations. They also reflect the problems that will persist even if such practices are used.

The soils making up each map unit are rated for *cultivated crops, pasture, woodland, and urban uses.* Cultivated crops are those grown extensively in the survey area. Pasture crops are those grown for livestock forage production. Woodland refers to areas of native or introduced trees. Urban uses include residential, commercial, and industrial developments.

The general soil map units in Independence County are described in the following pages.

Areas dominated by deep to shallow, nearly level to steep soils on uplands

The soils in this group make up about 35 percent of Independence County. They cover the northern part of the county and small areas in the central part that parallel the bottom lands of the White River. The soils are loamy, gravelly, very cherty, or stony. They formed in residuum of cherty limestone, cherty dolomite, siltstone, sandstone, and calcareous shale on the Springfield and Salem Plateaus in the Ozark Highland.

1. Clarksville-Gepp

Deep, gently sloping to steep, somewhat excessively drained and well drained very cherty soils; on side slopes and ridgetops

These soils are in the northwestern and north-central parts of the county. They formed in residuum of cherty limestone and cherty dolomite.

This map unit makes up about 22 percent of the county. About 54 percent of the unit is Clarksville soils, 17 percent is Gepp soils, and 29 percent is soils of minor extent.

Clarksville soils are deep and are somewhat excessively drained. Their surface layer is dark grayish brown very cherty silt loam. The subsurface layer is pale brown very cherty silt loam. The subsoil is yellowish brown, strong brown, and yellowish red very cherty silty clay loam.

Gepp soils are deep and are well drained. Their surface layer is very dark grayish brown very cherty silt loam. The subsurface layer is yellowish brown very cherty silt loam. The subsoil is red silty clay and clay. The underlying material is cherty limestone.

The soils of minor extent are well drained Arkana soils on side slopes and ridgetops, well drained Boden soils on side slopes, moderately well drained Captina soils on stream terraces and foot slopes, well drained Noark soils on uplands, and well drained Peridge soils on stream terraces.

The soils in this map unit are used mainly as pasture and woodland (fig. 1). In most of the less sloping areas they have been cleared and are used as pasture. In the moderately steep and steep areas they are used primarily for upland hardwoods. Most of the acreage was originally in hardwood forest.

Clarksville and Gepp soils are poorly suited to not suited to cultivated crops. Slope, chert on the surface, and the hazard of erosion are the main limitations.

In the gently sloping to moderately sloping areas these soils are moderately suited to use as pasture; in the steeper areas they are poorly suited. Clarksville soils are moderately suited to use as woodland, and Gepp soils are well suited.

Clarksville soils are well suited to poorly suited to most urban uses. Slope is the main limitation. Gepp soils are moderately suited to poorly suited to most urban uses. Slope and the shrink-swell potential are the main limitations. In the less sloping areas these limitations

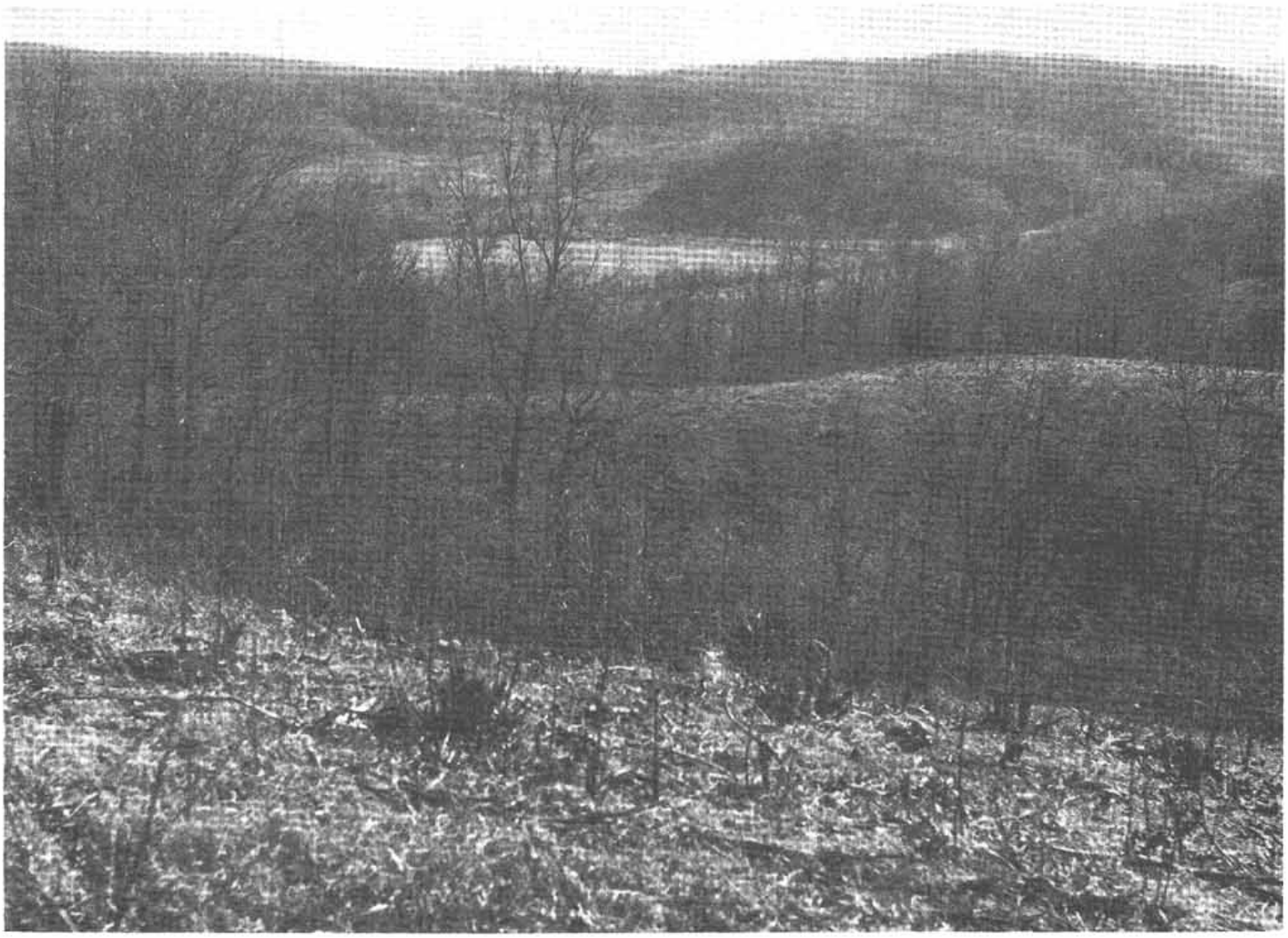


Figure 1.—Typical area of Clarksville and Gepp soils. The less sloping areas are used mainly as pasture, and the steeper areas are used as woodland.

generally can be overcome by proper engineering design and construction techniques. In the steeper areas the limitations are difficult to overcome.

2. Lily-Clarksville

Moderately deep and deep, gently sloping to steep, well drained and somewhat excessively drained loamy and cherty soils; on side slopes and ridgetops

These soils are mainly in the northern part of the county. Lily soils formed in residuum of sandstone. Clarksville soils formed in residuum of cherty limestone.

This map unit makes up about 5 percent of the county. About 49 percent of the unit is Lily soils, 25 percent is Clarksville soils, and 26 percent is soils of minor extent.

Lily soils are moderately deep and are well drained. Their surface layer is brown fine sandy loam. The subsoil is yellowish brown fine sandy loam, strong brown and yellowish red loam, and strong brown sandy clay loam. The underlying material is level-bedded, hard, acid sandstone.

Clarksville soils are deep and are somewhat excessively drained. They are on dissected uplands. Their surface layer is dark grayish brown very cherty silt loam (fig. 2). The subsurface layer is pale brown very cherty silt loam. The subsoil is strong brown, yellowish brown, and yellowish red very cherty silty clay loam.

The minor soils are well drained Arkana and Boden soils on side slopes and ridgetops, well drained Brockwell soils on uplands, well drained Portia soils on uplands, somewhat excessively drained Ramsey soils on

side slopes and ridgetops, and excessively drained Wideman soils on flood plains.

The soils in this map unit are used mainly as woodland. In most of the less sloping areas they have been cleared and are used as pasture. In the moderately sloping to steep areas the soils are used primarily for low-grade, upland hardwoods. Most of the acreage was originally in hardwood forest.

Lily soils are moderately suited to not suited to cultivated crops. Slope and the hazard of erosion are the main limitations. Clarksville soils are poorly suited to not suited to cultivated crops. Slope, chert on the surface, and the hazard of erosion are the main limitations.

Lily and Clarksville soils are well suited to poorly suited to use as pasture. They are moderately suited to use as woodland.

These soils are well suited to poorly suited to most urban uses. Moderate depth to rock and slope are the main limitations. In the less sloping areas these limitations generally can be overcome by proper engineering design and construction techniques. In the steep areas the limitations are difficult to overcome.

Figure 2.—Typical area of Lily and Clarksville soils. Clarksville soils, in the foreground, have chert on the surface.

3. Wallen-Captina

Moderately deep and deep, nearly level to steep, somewhat excessively drained and moderately well drained gravelly and loamy soils; on side slopes, ridgetops, and stream terraces

These soils are mainly in the central part of the county. Wallen soils formed in residuum of siltstone or of interbedded siltstone, shale, and sandstone. Captina soils formed in residuum of cherty limestone.

This map unit makes up about 3 percent of the county. About 45 percent of the unit is Wallen soils, 45 percent is Captina soils, and 10 percent is soils of minor extent.

Wallen soils are moderately deep and are somewhat excessively drained. They are gently sloping to steep. They are on uplands. Their surface layer is dark brown gravelly silt loam. The subsurface layer is yellowish brown gravelly silt loam, and the subsoil is yellowish brown very cobbly silt loam. The underlying material is hard, partly weathered siltstone.

Captina soils are deep and are moderately well drained. They are nearly level to gently sloping. They are on stream terraces and uplands. Their surface layer is dark brown silt loam. The subsurface layer is brown silt loam. The upper part of the subsoil is strong brown silty clay loam. The middle part consists of strong brown silt loam and a mottled cherty and very cherty silt loam fragipan. The lower part is mottled very cherty silty clay loam in seams of fractured seams of bedded chert.

The minor soils in this map unit are somewhat excessively drained Clarksville soils, well drained stony Enders soils and gravelly Linker soils on ridges and side slopes, moderately well drained Loring soils, and well drained Peridge and Portia soils at a lower elevation.

The soils in this unit are used mainly as pasture and woodland. In most areas they have been cleared and are used as improved pasture. In some steep areas they are in upland hardwoods. Most of the acreage was originally in hardwood forest.

Wallen soils are moderately suited to not suited to cultivated crops. Slope, the hazard of erosion, droughtiness, and coarse fragments are the main limitations. Captina soils are well suited or moderately suited to cultivated crops. The hazard of erosion is the main limitation.

Wallen soils are moderately suited to poorly suited to use as pasture and moderately suited to use as woodland. Captina soils are well suited to use as pasture and moderately suited to use as woodland.

Wallen soils are moderately suited to poorly suited to most urban uses. Depth to rock and slope are the main limitations. Captina soils are moderately suited to most urban uses. Slow permeability, low strength, wetness, and slope are the main limitations. Except in steep areas, these limitations generally can be overcome by proper engineering design and construction techniques.

4. Newnata-Moko

Deep and shallow, gently sloping to moderately steep, well drained loamy and stony soils; on side slopes, ridgetops, and benches

These soils are scattered throughout the southern part of the county. Newnata soils formed in residuum of interbedded limestone, alkaline shale, and siltstone. Moko soils formed in residuum of limestone.

This map unit makes up about 5 percent of the county. About 40 percent of the unit is Newnata soils, 14 percent is Moko soils, and 46 percent is soils of minor extent.

Newnata soils are deep and are gently sloping to moderately sloping. Their surface layer is dark brown silty clay loam. The subsoil is strong brown and yellowish brown, mottled silty clay. The underlying material is soft, weathered calcareous shale.

Moko soils are shallow and are gently sloping to moderately steep. Their surface layer is very dark gray very stony silt loam and very dark grayish brown very stony silty clay loam. The underlying material is hard limestone.

The minor soils are well drained Arkana soils on adjacent side slopes, moderately well drained Egam soils on flood plains, moderately well drained Sidon soils on broad plateaus and benches, and moderately well drained Hontas soils on flood plains. Rock outcrops are intermingled in some areas.

The soils in this map unit are used mainly as pasture and woodland. In most of the gently sloping to moderately sloping areas they have been cleared and are used as pasture. In the steeper areas they are used as woodland. The dominant trees are redcedar and low-grade hardwoods. Most of the acreage was originally an open stand of hardwoods and redcedar; prairie plants filled the openings.

Newnata soils are moderately suited to poorly suited to cultivated crops and moderately suited to use as improved pasture and woodland. Erosion is the main limitation. Moko soils are not suited to cultivated crops and improved pasture. They are poorly suited to use as woodland. Depth to rock, surface stones, slope, and erosion are the main limitations.

The soils in this unit are poorly suited to most urban uses. On the Newnata soils, slow permeability and high shrink-swell potential are the main limitations. On the Moko soils, depth to rock, stones on the surface, and slope are the main limitations. These limitations generally are difficult or impractical to overcome.

Areas dominated by deep, nearly level to moderately sloping soils on uplands and terraces

The soils in this group make up about 11 percent of Independence County. They are in the northeastern part of the county. They are loamy soils that formed in loess

and in residuum of interbedded sandstone, siltstone, and limestone.

5. Loring-Portia

Deep, nearly level to moderately sloping, moderately well drained and well drained loamy soils; on uplands and terraces

These soils are in the northeastern part of the county. Loring soils formed in loess. Portia soils formed in residuum of interbedded sandstone, siltstone, and limestone.

This map unit makes up about 11 percent of the county. About 43 percent of the unit is Loring soils, 23 percent is Portia soils, and 34 percent is soils of minor extent.

Loring soils are moderately well drained and are nearly level to moderately sloping. They are on uplands and terraces. Their surface layer is brown silt loam. The upper part of the subsoil is strong brown silty clay loam and silt loam. The middle and lower parts are a brown, mottled silt loam and silty clay loam fragipan.

Portia soils are well drained and are gently sloping to moderately sloping. They are on uplands. Their surface layer is dark brown fine sandy loam. The subsurface layer is brown fine sandy loam. The subsoil is yellowish red and red, mottled sandy clay loam.

The minor soils are the well drained Boden, Enders, and Saffell soils on side slopes and ridgetops, the moderately well drained Captina soils on uplands and stream terraces, the well drained Gepp soils in hilly areas, and the moderately well drained Hontas soils along streams.

In most areas the soils in this map unit are used as pasture. In a few small areas they are used for cultivated crops and orchards and as woodland. Most of the acreage originally was covered by a dense stand of hardwoods, mainly upland oaks.

Loring and Portia soils are well suited to poorly suited to cultivated crops and well suited to use as pasture and woodland. A moderate to severe hazard of erosion is the main limitation.

Loring and Portia soils are moderately suited to poorly suited to most urban uses. Wetness, slow permeability, slope, and low strength are the main limitations. These limitations generally can be overcome by proper engineering design and construction techniques.

Areas dominated by deep, level to gently undulating soils on flood plains and terraces

The soils in this group make up about 21 percent of Independence County. They are along the White River, Black River, Polk Bayou, Departee Creek, Saldo Creek, and Greenbrier Creek. The soils formed in silty, loamy, and clayey alluvium on natural levees, backswamps, and flood plains.

6. Wideman-Sturkie

Deep, level to nearly level, excessively drained and well drained sandy and loamy soils; on flood plains

These soils are in the western part of the county on flood plains along the White River. They formed in sandy and silty alluvium.

This map unit makes up about 1 percent of the county. About 70 percent of the unit is Wideman soils, 20 percent is Sturkie soils, and 10 percent is soils of minor extent.

Wideman soils are excessively drained and are level. Their surface layer is brown loamy fine sand. The subsurface layer is dark yellowish brown fine sandy loam. The underlying material is yellowish brown, dark yellowish brown, and light yellowish brown fine sand; dark yellowish brown fine sandy loam; and dark yellowish brown and light yellowish brown loamy fine sand.

Sturkie soils are well drained and are level to nearly level. Their surface layer is very dark grayish brown silt loam. The subsoil is dark brown silt loam and silty clay loam. Wideman and Sturkie soils are flooded frequently in winter and spring.

The minor soils are the well drained Arrington soils on natural levees and the moderately well drained Egam soils on flood plains. There are some gravel bars and areas of sandy overwash.

In most areas the soils in this map unit are used for pasture and hay. In a few small areas they are used for cultivated crops. Most of the acreage originally was covered by a dense stand of mixed hardwoods.

Wideman soils are not suited to cultivated crops because of flooding and droughtiness. Wideman soils are moderately suited to use as pasture and well suited to use as woodland. Sturkie soils are moderately suited to cultivated crops and pasture. Flooding in winter and spring is the main limitation. Sturkie soils are well suited to use as woodland.

The soils in this unit are severely limited for most urban uses because of flooding.

7. Egam-Arrington

Deep, level to gently undulating, moderately well drained and well drained loamy soils; on flood plains and natural levees on bottom lands of the White River

These soils are mainly on bottom lands of the White River (fig. 3). They formed in loamy or clayey alluvium.

This map unit makes up about 8 percent of the county. About 48 percent of the unit is Egam soils, 35 percent is Arrington soils, and 17 percent is soils of minor extent.

Egam soils are moderately well drained. They are on flood plains. Their surface layer is very dark grayish brown silt loam and silty clay loam. The subsoil is very dark grayish brown and dark brown mottled silty clay loam.

Arrington soils are well drained. They are on natural levees. Their surface layer is dark brown silt loam. The

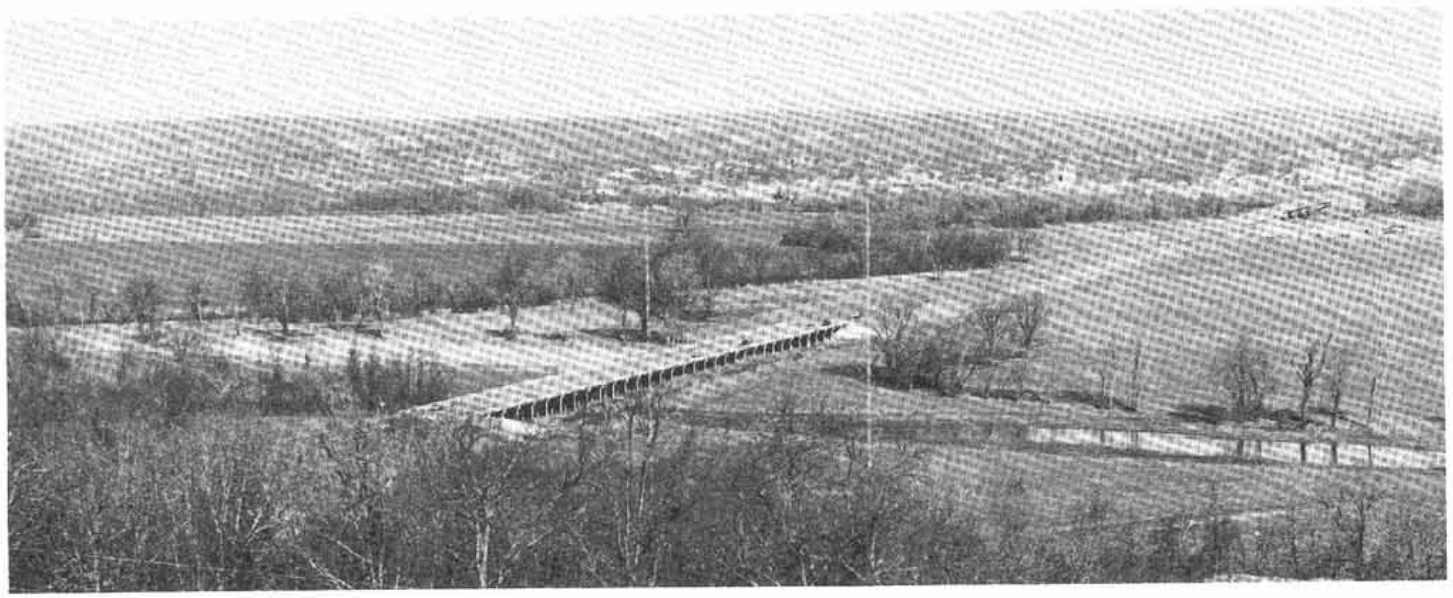


Figure 3.—Bottom lands of the White River in an area south of Batesville. Egam and Arrington soils are the major soils in this area.

subsoil is dark brown silt loam and silty clay loam. The underlying material is dark brown, mottled loam.

The minor soils are moderately well drained Askew soils on natural levees, poorly drained Amagon and Forestdale soils in depressions, well drained Dubbs soils on gently undulating natural levees or low terraces, moderately well drained Hontas soils on flood plains, and excessively drained Wideman soils on flood plains.

The soils in this map unit are used mainly for cultivated crops. In a few small areas they are used for hay and pasture. Most of the acreage was originally in a dense stand of mixed hardwoods.

Egam and Arrington soils are well suited to cultivated crops and to use as pasture and woodland. If the Arrington soils are used for crops, erosion is a moderate limitation. If the Egam soils are used for cultivated crops, wetness is a moderate limitation.

Arrington soils are well suited to most urban uses, and Egam soils are poorly suited. Flooding is the main limitation. This limitation is difficult or impractical to overcome.

8. Amagon-Askew-Forestdale

Deep, level to gently undulating, poorly drained and moderately well drained loamy soils; on the lower part of natural levees

These soils are in the eastern part of the county. They are on bottom lands along the White and Black Rivers. These soils formed in loamy and clayey alluvium.

This map unit makes up about 11 percent of the county. About 48 percent of the unit is Amagon soils, 15 percent is Askew soils, 14 percent is Forestdale soils, and 23 percent is soils of minor extent.

Amagon soils are poorly drained. They are on the lower part of natural levees. Their surface layer is dark grayish brown silt loam. The subsurface layer is gray, mottled silt loam, and the subsoil is gray and grayish brown, mottled silty clay loam. The underlying material is gray, mottled silty clay loam.

Askew soils are moderately well drained. They are on natural levees. Their surface layer is dark brown silt loam.

The subsoil is yellowish brown silt loam and yellowish brown, light brownish gray, and grayish brown, mottled silty clay loam. The underlying material is gray, mottled silt loam.

Forestdale soils are poorly drained. They are on the lower part of natural levees. Their surface layer is dark grayish brown silt loam. The subsoil is light brownish gray and gray, mottled silty clay and silty clay loam.

The minor soils are somewhat poorly drained Crowley soils on broad flats, well drained Dubbs soils on gently undulating natural levees, moderately well drained Egam soils on flood plains, poorly drained Foley soils on broad flats, poorly drained Jackport soils on broad flats and terraces, and moderately well drained Hontas soils on flood plains along streams.

The soils in this map unit are used mainly for cultivated crops. In a few small areas they are used as woodland. Most of the acreage originally was covered by a dense stand of mixed hardwoods, mainly water-tolerant oaks.

Amagon and Forestdale soils are moderately suited to cultivated crops that have a short growing season and to

pasture. Wetness and flooding are the main limitations. Askew soils are well suited to cultivated crops and pasture. Wetness is a moderate limitation. All of these soils are well suited to use as woodland.

The soils are poorly suited to most urban uses. On the Amagon soils, wetness and flooding are the main limitations. On the Forestdale soils, wetness, flooding, and a high shrink-swell potential are the main limitations. On the Askew soils, wetness is the main limitation. These limitations generally are difficult or impractical to overcome.

9. Jackport-Crowley

Deep, level, poorly drained and somewhat poorly drained loamy soils; on broad flats of terraces

These soils are in the southeastern corner of the county. Jackport soils formed in clayey alluvium in slack water areas. Crowley soils formed in loamy material underlain by clayey alluvium.

This map unit makes up about 1 percent of the county. About 40 percent of the unit is Jackport soils, 40 percent is Crowley soils, and 20 percent is soils of minor extent.

Jackport soils are poorly drained. Their surface layer is dark grayish brown silty clay loam. The subsurface layer is gray, mottled silty clay loam, and the subsoil is grayish brown and dark grayish brown, mottled clay and grayish brown, mottled silty clay.

Crowley soils are somewhat poorly drained. Their surface layer is dark grayish brown silt loam. The subsurface layer is gray, mottled silt loam, and the subsoil is grayish brown, mottled silty clay and light brownish gray, mottled silty clay loam. The underlying material is mottled light brownish gray, yellowish brown, and strong brown silty clay loam.

The minor soils in this map unit are poorly drained Amagon and Forestdale soils in depressions and on broad flats, moderately well drained Askew soils on natural levees, and poorly drained Foley soils on broad flats.

The soils in this map unit are used mainly for cultivated crops. In a few small areas they are used as woodland. Most areas originally were covered by a dense stand of mixed hardwoods.

Jackport and Crowley soils are well suited to most cultivated crops and to use as pasture and woodland. Wetness is the main limitation.

Jackport and Crowley soils are poorly suited to most urban uses because of wetness, slow permeability, low strength, and a high shrink-swell potential. These limitations are difficult or impractical to overcome.

Areas dominated by deep to shallow, nearly level to very steep soils on uplands

The soils in this group make up about 33 percent of Independence County. They are in the southern part of the county, except for one area that is in the central part. The soils are loamy, gravelly, and stony. They formed in residuum of sandstone and shale or of interbedded siltstone, sandstone, and shale.

10. Linker-Enders-Mountainburg

Moderately deep, deep, and shallow, gently sloping to very steep, well drained loamy, gravelly, and stony soils; on side slopes and ridgetops

These soils are mainly in the southwestern part of the county. They formed in residuum of sandstone and shale or of interbedded sandstone and shale.

This map unit makes up about 18 percent of the county. About 45 percent of the unit is Linker soils, 40 percent is Enders soils, 5 percent is Mountainburg soils, and 10 percent is soils of minor extent.

Linker soils are moderately deep and are gently sloping to steep. Their surface layer is very dark grayish brown fine sandy loam. The subsoil is strong brown fine sandy loam, yellowish red loam, and yellowish red, mottled gravelly sandy clay loam. The underlying material is hard, level-bedded acid sandstone.

Enders soils are deep and are gently sloping to very steep. The surface layer is very dark grayish brown and brown stony fine sandy loam. The subsoil is red, mottled clay. The underlying material is partly weathered shale and siltstone bedrock.

Mountainburg soils are shallow and are gently sloping to moderately sloping. The surface layer is dark brown stony fine sandy loam. The subsoil is strong brown very gravelly sandy clay loam and very gravelly sandy loam. The underlying material is hard, level-bedded acid sandstone.

The soils of minor extent are moderately well drained Sidon soils on undulating plateaus, ridgetops, and side slopes and well drained Spadra soils on stream terraces.

The soils in this map unit are used mainly as woodland. In a few small areas they are used for specialty crops and cultivated crops. Most of the acreage originally was mainly in mixed hardwoods and pine.

Enders soils are not suited to cultivated crops. Linker soils are moderately suited to not suited to cultivated crops. The hazard of erosion and stones on the surface are the main limitations. Mountainburg soils are not suited to cultivated crops. Shallowness to rock and stones on the surface are the main limitations.

The soils in this unit are well suited to not suited to use as pasture and hayland. The steepness of the slope and stones on the surface are the main limitations.

Linker soils are moderately suited to use as woodland, Enders soils are moderately suited to poorly suited, and Mountainburg soils are poorly suited.

The soils in this unit are moderately suited to poorly suited to most urban uses. Depth to rock and steepness of the slope are the main limitations on the Linker and

Figure 4.—Fescue pasture on Linker and Sidon soils. In the less sloping areas these soils are well suited to use as pasture.

Mountainburg soils. Slope and the shrink-swell potential are the main limitations on the Enders soils.

11. Linker-Sidon

Moderately deep and deep, nearly level to steep, well drained and moderately well drained loamy soils; on ridgetops, side slopes, and plateaus

These soils are scattered throughout the southern and west-central parts of the county. They formed in residuum of sandstone or of interbedded sandstone, siltstone, and shale.

This map unit makes up about 15 percent of the county. About 45 percent of the unit is Linker soils, 40 percent is Sidon soils, and 15 percent is soils of minor extent.

Linker soils are moderately deep and are gently sloping to steep. Their surface layer is very dark grayish brown fine sandy loam or gravelly fine sandy loam, and the subsoil is strong brown fine sandy loam, yellowish red loam, and yellowish red, mottled gravelly sandy clay loam. The underlying material is hard, level-bedded acid sandstone.

Sidon soils are deep and are nearly level to moderately sloping. Their surface layer is yellowish brown silt loam. The upper part of the subsoil is strong

brown loam and yellowish brown clay loam. The middle part is a yellowish brown, mottled clay loam fragipan. The lower part of the subsoil is yellowish brown, mottled clay loam. The underlying material is hard, level-bedded sandstone.

The minor soils are well drained Enders and Mountainburg soils on side slopes and ridgetops and well drained Spadra soils on stream terraces.

In most areas the soils in this map unit are used as woodland. On the broad plateaus and other less sloping areas they are used as pasture (fig. 4). Most of the acreage was originally in mixed hardwoods and pine.

Linker soils are moderately suited to not suited to cultivated crops, and Sidon soils are well suited to poorly suited. Slope and the hazard of erosion are the main limitations. These soils are suited to poorly suited to use as pasture. Linker soils are moderately suited to use as woodland, and Sidon soils are well suited.

The soils are moderately suited to poorly suited to most urban uses. On the Linker soils, depth to rock and slope are the main limitations. On the Sidon soils, slow permeability, wetness, and slope are the main limitations.

broad land use considerations

The soils in Independence County vary widely in their potential for major land uses. Approximately 16 percent of the land in the county is used for cultivated crops, mainly soybeans, rice, sorghum, and wheat. This cropland is scattered throughout the county, but it is concentrated largely in general soil map units 7, 8, and 9, which are well suited to moderately suited to crops.

The Amagon and Forestdale soils in map unit 8 are frequently flooded, principally from December to April. The flooding causes moderate to severe damage to winter crops. Flooding is the major limitation for crops. The major soils in unit 8 are Amagon, Askew, and Forestdale soils. The soils in map units 7 and 9 are on broad flats and gently undulating natural levees. Wetness and the hazard of erosion are the main limitations for crops. Arrington, Crowley, Egam, and Jackport soils are the major soils in units 7 and 9.

Approximately 34 percent of the land in the county is pasture. The soils in map units 3, 5, 6, 7, 8, and 9 have moderate to high potential for grasses and legumes. The major soils in these units are Amagon, Arrington, Askew, Crowley, Egam, Forestdale, Jackport, Sturkie, and Wideman soils on flood plains and Captina, Loring, Portia, and Wallen soils on uplands.

About 45 percent of the land in the county is woodland. The productivity for hardwoods is very high on soils in map units 5, 6, 7, 8, and 9 and high on soils in units 1, 2, 3, 10, and 11. The use of logging equipment is restricted on some soils except during the drier seasons.

About 5 percent, 20,000 acres, in the county are classified as urban or built-up land. In general, the gently undulating to moderately sloping Arrington, Captina, Egam, Linker, Loring, and Portia soils, in map units 3, 5, 7, and 10, have moderate to high potential for urban uses. In other map units, the principal limitations of the soils for urban uses are shallowness to rock, stones, low strength, wetness, and steep slopes. Soils on flood plains, for example, those in units 8 and 9, have low potential for urban development because of flooding or wetness. Arkana, Clarksville, Enders, Gepp, Lily, Moko, Newnata, and Noark soils, in map units 1, 2, 4, and 11, have low potential because of steep slopes, high shrink-swell potential, stones, and depth to rock. Sites that are suitable for houses or small commercial buildings, however, are generally available on these soils.

The potential for recreation uses ranges from low to high, depending on the intensity of the expected use and the properties of the soils. The soils in map unit 5, for the most part, have high potential for intensive recreation uses, for example, playgrounds, camp areas, and picnic areas. The soils in unit 8 have low potential because of flooding. The soils in map units 1, 2, 3, 4, 10, and 11, because they are hilly to steep, also have low potential. Most of these soils, however, are suitable for extensive recreation uses, hiking, for example. Small areas in map units that generally have low potential may be suitable for intensive recreation uses.

The potential of the soils for use as habitat for wildlife generally is high throughout the county. The soils in map unit 5 have good potential for habitat for openland wildlife, and the soils in map units 1, 2, 4, 10, and 11 have moderate to high potential for habitat for woodland wildlife. The soils on flood plains in map unit 8 have high potential for habitat for wetland wildlife. Forestdale and Amagon soils are especially suited as shallow water areas for waterfowl.

detailed soil map units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and management of the soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Linker gravelly fine sandy loam is one of several phases in the Linker series.

Some map units are made up of two or more major soils. Such a map unit is called a soil complex.

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Arkana-Moko complex, 3 to 8 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits-Dumps complex, 20 to 40 percent slopes, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 6 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

soil descriptions

1—Amagon silt loam, frequently flooded. This is a deep, level, poorly drained soil on the lower part of natural levees and in shallow depressions on bottom lands of the Black and White Rivers. This soil normally is flooded each year. Individual areas range from about 20 to more than 200 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsurface layer is gray, mottled silt loam about 10 inches thick. The subsoil is gray, mottled silty clay loam to a depth of about 29 inches; grayish brown, mottled silty clay loam to a depth of about 41 inches; and gray, mottled silty clay loam to a depth of about 57 inches. The underlying material is gray, mottled silty clay loam to a depth of 72 inches or more.

Natural fertility is moderate, and the content of organic matter is low. Reaction ranges from medium acid to very strongly acid in the surface layer and upper part of the subsoil and from mildly alkaline to strongly acid in the lower part of the subsoil and the underlying material. Permeability is slow. The available water capacity is high. This soil has a water table perched within 1 to 2 feet of the surface late in winter and early in spring. Flooding is frequent and normally occurs from December to April. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Askew, Dubbs, Foley, and Forestdale soils and a few small areas where the soil is not frequently flooded.

Figure 5.—Grain sorghum on Amagon silt loam, frequently flooded. This soil is moderately suited to crops that have a short growing season.

This soil is moderately suited to crops that have a short growing season. It is used mainly as cropland. The principal crops are rice and soybeans. The soil is also suited to grain sorghum (fig. 5). Flooding is a severe hazard from December to April in most years, and only warm-season annual crops that have a short growing season can be grown. If the soils are well managed, crops that leave a large amount of residue can be grown most years. However, crops are likely to be damaged by flooding in some years.

This soil is moderately suited to use as pasture. Adapted pasture plants include common bermudagrass and legumes. Wetness and flooding are severe limitations for pasture late in winter and early in spring. These limitations can be overcome by scheduling grazing and haying during the drier seasons.

This soil is well suited to use as woodland. Adapted species include green ash, eastern cottonwood, cherrybark oak, nuttall oak, water oak, willow oak, and sweetgum. Wetness severely limits the use of equipment. Logging should be scheduled during the drier seasons.

This soil is poorly suited to most urban uses. Wetness and flooding are severe limitations for septic tank filter fields, dwellings, small commercial buildings, and local roads and streets. The slow permeability is a severe limitation for septic tank filter fields. Low strength is a severe limitation for local roads and streets. These limitations are difficult or impractical to overcome.

This soil is in capability unit IVw-1 and in woodland suitability group 1w6.

2—Arkana-Moko complex, 3 to 8 percent slopes. This complex consists of Arkana and Moko soils in small areas that are so intermingled that they could not be mapped separately. The individual areas of each soil are about 3 to 8 acres in size, and the mapped areas of this complex are about 25 to 250 acres in size. The Arkana soils are on gently sloping benches, side slopes, and ridgetops. The Moko soils are on gently sloping benches and ridgetops. Slopes are uneven and convex. In many places the landscape has a stepped appearance because of outcrops of horizontally bedded limestone bedrock.

Arkana soils make up about 55 percent of each mapped area, Moko soils make up 35 percent, and the included soils make up 10 percent.

Typically, the surface layer of the Arkana soils is very dark gray cherty silt loam about 4 inches thick. The subsurface layer is dark brown cherty silt loam about 2 inches thick. The subsoil is yellowish red silty clay to a depth of about 12 inches; red, mottled clay to a depth of about 20 inches; and dark yellowish brown, mottled clay to a depth of about 24 inches. Hard, level-bedded limestone bedrock is below a depth of 24 inches.

Natural fertility of the Arkana soils is moderate, and the content of organic matter is moderate. The surface layer is mildly alkaline to medium acid, and the subsoil is moderately alkaline to strongly acid. Permeability is very slow. The available water capacity is low.

Typically, the surface layer of the Moko soils is very dark gray very stony silt loam about 3 inches thick. The subsurface layer is very dark grayish brown very stony silty clay loam about 7 inches thick. Gray, hard, fractured limestone is below a depth of about 10 inches.

Natural fertility of the Moko soils is moderate, and the content of organic matter is moderate. Reaction is mildly alkaline to neutral throughout. Permeability is moderate. The available water capacity is very low.

Included with these soils in mapping are areas of rock outcrop, Gepp soils, and soils that are similar to Arkana soils except that they have a yellowish brown subsoil.

The soils in this complex are not suited to cultivated crops and are poorly suited to use as pasture. The hazard of erosion and coarse fragments on the surface are the main limitations on the Arkana soils. Stones on the surface and shallowness to rock are the main limitations on the Moko soils. Moko soils are commonly droughty because of shallowness to bedrock. Tillage is difficult because of coarse fragments on the surface.

The soils are used mainly as woodland and as habitat for wildlife. The trees are mainly low-grade hardwoods and cedar. Arkana soils are poorly suited to use as woodland. Adapted species are eastern redcedar and shortleaf pine. The use of equipment is moderately limited, and seedling mortality is moderate. Moko soils are poorly suited to use as woodland. The main adapted species is eastern redcedar. The use of equipment is severely limited, seedling mortality is moderate, and erosion is a moderate hazard.

The soils in this complex are poorly suited to most urban uses. Arkana soils have severe limitations for most urban uses. The very slow permeability and depth to rock are severe limitations for septic tank absorption fields. The high shrink-swell potential is a severe limitation for dwellings and small commercial buildings. Low strength and the high shrink-swell potential are severe limitations for local roads and streets. Moko soils also have severe limitations for urban uses. Depth to rock and large stones are severe limitations for septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets. These limitations are difficult or impractical to overcome.

These soils are in capability unit VIs-1. The Arkana soils are in woodland suitability group 5c8, and the Moko soils are in group 5x3.

3—Arrington silt loam, gently undulating. This is a deep, well drained soil on natural levees on bottom lands of the White River. Individual areas range from about 20 to 200 acres in size. Slopes are 0 to 3 percent.

Typically, the surface layer is dark brown silt loam about 24 inches thick. The subsoil is dark brown silt loam and silty clay loam about 30 inches thick. The underlying material is dark brown loam to a depth of 72 inches or more.

Natural fertility is high, and the content of organic matter is moderate. This soil is mildly alkaline to slightly acid throughout. Permeability is moderate. The available water capacity is high. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Egam and Wideman soils. Also included are a few small areas where the surface layer is sandy loam, a few small areas where the soil is flooded occasionally, and a few small areas adjacent to former stream channels where slopes are short and are more than 3 percent.

This soil is well suited to row crops and winter small grains. It is used mainly as cropland. The main crop is soybeans. Other crops that grow well are corn, cotton, grain sorghum, and alfalfa. Erosion is a moderate hazard where the soil is more sloping. Minimum tillage, contour cultivation, and the use of cover crops help reduce

runoff and control erosion. Drainage may be needed in some depressions to remove excess water.

This soil is well suited to pasture and hay. Adapted pasture plants include common bermudagrass, tall fescue, improved bermudagrass, and alfalfa.

This soil is well suited to use as woodland. Adapted species include white oak, southern red oak, and loblolly pine. There are no significant limitations to woodland use and management.

This soil is well suited to most urban uses. The moderate permeability is a moderate limitation for septic tank filter fields. There are no significant limitations for dwellings or small commercial buildings. Low strength is a moderate limitation for local roads and streets. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IIe-2 and in woodland suitability group 2o7.

4—Askew silt loam, gently undulating. This is a deep, moderately well drained soil on natural levees along former stream channels on bottom lands of the Black River. Wide ridges alternate with narrow swales. Individual areas range from about 20 to more than 400 acres in size. Slopes are 0 to 3 percent.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The subsoil is yellowish brown, mottled silt loam and silty clay loam to a depth of about 25 inches and light brownish gray and grayish brown, mottled silty clay loam to a depth of about 42 inches. The underlying material is gray, mottled silt loam to a depth of 72 inches or more.

Natural fertility is moderate, and the content of organic matter is low. This soil is medium acid to very strongly acid throughout. Permeability is moderate. The available water capacity is high. A water table is perched within 1 to 2 feet of the surface from December to April. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Amagon, Dubbs, and Forestdale soils and a few areas in swales where the soil is occasionally flooded.

This soil is well suited to row crops and winter small grains. It is used mainly as cropland. The main limitation is wetness. The main crop is soybeans. The soil is also suited to cotton, winter small grains, grain sorghum, and truck crops. Erosion is a moderate hazard in the more sloping areas. Contour cultivation, minimum tillage, and cover crops help reduce runoff and control erosion. Drainage may be needed in some depressed areas to remove excess water.

This soil is well suited to use as pasture and for hay. Adapted pasture plants include bermudagrass and tall fescue. The main limitation is wetness in the depressed areas.

This soil is well suited to use as woodland. Adapted species include eastern cottonwood, cherrybark oak, water oak, willow oak, and sweetgum. There are no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Wetness is a severe limitation for septic tank filter fields, dwellings, and small commercial buildings. Low strength is a severe limitation for local roads and streets. These limitations are difficult or impractical to overcome.

This soil is in capability unit IIw-1 and in woodland suitability group 2o7.

5—Boden fine sandy loam, 3 to 8 percent slopes. This is a deep, well drained, gently sloping soil on ridgetops and side slopes in the Ozark Highlands. Individual areas range from 10 to 200 acres in size.

Typically, the surface layer is dark brown and yellowish brown fine sandy loam about 8 inches thick. The subsurface layer is strong brown fine sandy loam about 4 inches thick. The subsoil is yellowish red sandy clay loam to a depth of about 22 inches and red, mottled sandy clay to a depth of about 44 inches. The underlying material is red, mottled sandy clay loam to a depth of about 56 inches. Level-bedded acid sandstone bedrock is below a depth of 56 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to very strongly acid throughout. Permeability is moderately slow. The available water capacity is medium. Runoff is medium. Erosion is a severe hazard if cultivated crops are grown. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Brockwell, Lily, and Portia soils. Also included are a few small areas where the surface layer is gravelly.

This soil is moderately suited to cultivated crops. The hazard of erosion is a severe limitation. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

This soil is well suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include common bermudagrass, tall fescue, and annual lespedeza. There are no significant limitations to pasture use and management.

This soil is moderately suited to use as woodland. Adapted species are southern red oak, loblolly pine, black walnut, shortleaf pine, and white oak. There are no significant limitations to woodland use and management.

This soil is moderately suited to poorly suited to most urban uses. The moderately slow permeability is a severe limitation for septic tank filter fields. The moderate shrink-swell potential is a moderate limitation for dwellings and small commercial buildings. Slope is a moderate limitation for small commercial buildings. Low strength is a severe limitation for local roads and streets. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IIIe-1 and in woodland suitability group 4o7.

6—Boden fine sandy loam, 8 to 12 percent slopes. This is a deep, well drained, moderately sloping soil on side slopes in the Ozark Highlands. Individual areas range from about 20 to 150 acres in size.

Typically, the surface layer is dark brown and yellowish brown fine sandy loam about 8 inches thick. The subsurface layer is strong brown fine sandy loam; it extends to a depth of about 12 inches. The subsoil is yellowish red sandy clay loam to a depth of about 22 inches and red, mottled sandy clay to a depth of about 44 inches. The underlying material is red, mottled sandy clay loam to a depth of about 56 inches. Level-bedded acid sandstone bedrock is below a depth of 56 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to very strongly acid throughout. Permeability is moderately slow. The available water capacity is medium. Runoff is medium to rapid. Erosion is a very severe hazard if cultivated crops are grown. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Brockwell, Lily, and Portia soils. Also included are a few small areas where the surface layer is gravelly.

This soil is poorly suited to cultivated crops. Erosion is a very severe hazard. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

This soil is well suited to use as pasture. It is used mainly as pasture. Adapted pasture plants include common bermudagrass and tall fescue. There are no significant limitations to pasture use and management.

This soil is moderately suited to use as woodland. Adapted species include southern red oak, eastern redcedar, black walnut, shortleaf pine, white oak, and loblolly pine. There are no significant limitations to woodland use and management.

This soil is moderately suited to poorly suited to most urban uses. The moderately slow permeability is a severe limitation for septic tank filter fields. The moderate shrink-swell potential and slope are moderate limitations for dwellings. Slope is a severe limitation for small commercial buildings. Low strength is a severe limitation for local roads and streets. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IVe-1 and in woodland suitability group 4o7.

7—Boden stony fine sandy loam, 8 to 20 percent slopes. This is a deep, well drained, moderately sloping to moderately steep soil on side slopes in the Ozark Highlands. Individual areas range from about 10 to 120 acres in size.

Typically, the surface layer is dark brown stony fine sandy loam about 3 inches thick. The subsurface layer is yellowish brown and strong brown fine sandy loam about 7 inches thick. The subsoil is yellowish red sandy clay loam to a depth of about 22 inches and red, mottled sandy clay to a depth of about 44 inches. The underlying material is red, mottled sandy clay loam to a depth of about 56 inches. Level-bedded acid sandstone bedrock is below a depth of 56 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to very strongly acid throughout. Permeability is moderately slow. The available water capacity is medium. Runoff is rapid, and erosion is a very severe hazard.

Included with this soil in mapping are a few small areas of Lily and Brockwell soils. There are rock outcrops in a few areas.

This soil generally is not suited to cultivated crops. The main limitations are a very severe hazard of erosion and a stony surface that interferes with tillage. Slope restricts the use of some farm equipment.

This soil is poorly suited to use as pasture because of the stony surface and the steepness of the slope. Adapted pasture plants include common bermudagrass and tall fescue.

This soil is moderately suited to use as woodland, and it is used mainly as woodland. Adapted species include southern red oak, eastern redcedar, black walnut, shortleaf pine, white oak, and loblolly pine. Erosion is a moderate hazard, and the use of equipment is moderately limited.

This soil is moderately suited to poorly suited to most urban uses. The moderately slow permeability is a severe limitation for septic tank filter fields. The moderate shrink-swell potential and slope are moderate limitations for dwellings. Slope is a severe limitation for small commercial buildings. Low strength is a severe limitation for local roads and streets. These limitations generally are difficult to overcome and require special engineering design.

This soil is in capability unit VIs-1 and in woodland suitability group 4x8.

8—Brockwell fine sandy loam, 3 to 8 percent slopes. This is a deep, well drained, gently sloping soil on ridgetops and upper side slopes in the Ozark Highlands. Individual areas range from 30 to 250 acres in size.

Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsurface layer is dark yellowish brown fine sandy loam about 6 inches thick. The subsoil is strong brown fine sandy loam to a depth of about 32 inches; strong brown, mottled fine sandy loam to a depth of about 60 inches; and mottled yellowish red, strong brown, and yellowish brown fine sandy loam to a depth of 80 inches or more.

Natural fertility is low, and the content of organic matter is low. This soil is medium acid to very strongly acid throughout. Permeability is moderate. The available water capacity is medium. Runoff is medium, and erosion

is a severe hazard if cultivated crops are grown. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Boden, Lily, and Portia soils. Also included are a few small areas where the soil has a gravelly surface. In places there are boulders on the surface, and there are some rock outcrops.

This soil is moderately suited to cultivated crops. The hazard of erosion is a severe limitation. Minimum tillage, contour farming, and cover crops help reduce runoff and control erosion.

This soil is well suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include tall fescue and bermudagrass. There are no significant limitations to pasture use and management.

This soil is well suited to use as woodland. Adapted species include shortleaf pine, loblolly pine, southern red oak, and white oak. There are no significant limitations to woodland use and management.

This soil is well suited to moderately suited to most urban uses. The moderate permeability is a moderate limitation for septic tank filter fields. Slope is a moderate limitation for small commercial buildings. These limitations generally can be overcome by proper engineering design. There are no significant limitations for dwellings or local roads and streets.

This soil is in capability unit IIIe-1 and in woodland suitability group 3o7.

9—Captina silt loam, 1 to 3 percent slopes. This is a deep, moderately well drained, nearly level soil on uplands and stream terraces in the Ozark Highlands. Individual areas range from about 15 to 50 acres in size.

Typically, the surface layer is dark brown silt loam about 2 inches thick. The subsurface layer is brown silt loam; it extends to a depth of about 6 inches. The upper part of the subsoil is strong brown silty clay loam; it extends to a depth of about 24 inches. The middle part is a compact fragipan of mottled silt loam, cherty silt loam, and very cherty silt loam; it extends to a depth of about 62 inches. The lower part of the subsoil is mottled yellowish red, strong brown, and gray very cherty silty clay loam in seams and fractures of partly weathered bedded chert; it extends to a depth of 72 inches or more.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid or very strongly acid throughout. Permeability is moderate above the fragipan and slow in the fragipan, which begins at a depth of 18 to 30 inches. The fragipan restricts root penetration and slows the movement of water through the soil. The available water capacity is medium. A water table is perched within 2 to 3 feet of the surface in winter and early in spring. Runoff is medium, and erosion is a moderate hazard if cultivated crops are grown. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Clarksville, Noark, and Wallen soils. Also included are a few small areas of a soil that is similar to this Captina soil except that it has a cherty surface layer and a few small areas where slopes are more than 3 percent.

This soil is well suited to cultivated crops. The main limitation is the moderate hazard of erosion. Adapted crops include soybeans, winter small grains, and truck crops.

This soil is well suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include common bermudagrass and tall fescue. There are no significant limitations to pasture use and management.

This soil is moderately suited to use as woodland. Adapted species include shortleaf pine, southern red oak, eastern redcedar, black locust, and black walnut. There are no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Wetness, depth to rock, and slow permeability in the fragipan are severe limitations for septic tank absorption fields. Wetness is a moderate limitation for dwellings and small commercial buildings. Low strength and wetness are moderate limitations for local roads and streets. These limitations generally can be overcome by proper engineering design and drainage.

This soil is in capability unit IIe-1 and in woodland suitability group 4o7.

10—Captina silt loam, 3 to 8 percent slopes. This is a deep, moderately well drained, gently sloping soil on uplands and stream terraces in the Ozark Highlands. Individual areas range from 15 to 125 acres.

Typically, the surface layer is dark brown silt loam about 2 inches thick. The subsurface layer is brown silt loam about 4 inches thick. The upper part of the subsoil is strong brown silty clay loam; it extends to a depth of about 24 inches. The middle part is a compact fragipan of mottled silt loam, cherty silt loam, and very cherty silt loam; it extends to a depth of about 62 inches. The lower part of the subsoil is mottled yellowish red, strong brown, and gray very cherty silty clay loam in seams and fractures of partly weathered bedded chert; it extends to a depth of 72 inches or more.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid or very strongly acid throughout. Permeability is moderate above the fragipan and slow in the fragipan, which begins at a depth of 18 to 30 inches. The fragipan restricts root penetration and slows the movement of water through the soil. The available water capacity is medium. A water table is perched within 2 to 3 feet of the surface in winter and early in spring. Runoff is medium, and erosion is a severe hazard if cultivated crops are grown. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Clarksville, Noark, and Wallen soils. Also included are a few small areas where slopes are less than 3 percent.

This soil is moderately suited to cultivated crops in the less sloping areas. The main limitation is the severe hazard of erosion.

This soil is well suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include common bermudagrass and tall fescue. There are no significant limitations to pasture use and management.

This soil is moderately suited to use as woodland. Adapted species include shortleaf pine, southern red oak, eastern redcedar, black locust, and black walnut. There are no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Wetness and the slow permeability in the fragipan are severe limitations for septic tank absorption fields. Wetness is a moderate limitation for dwellings. Slope and wetness are severe limitations for small commercial buildings. Low strength and wetness are moderate limitations for local roads and streets. These limitations generally can be overcome by proper engineering design and drainage.

This soil is in capability unit IIIe-2 and in woodland suitability group 4o7.

11—Clarksville very cherty silt loam, 3 to 8 percent slopes. This is a deep, somewhat excessively drained, gently sloping soil on ridgetops and adjacent side slopes in dissected hilly areas in the Ozark Highlands. Individual areas range from about 25 to 150 acres in size.

Typically, the surface layer is dark grayish brown very cherty silt loam about 3 inches thick. The subsurface layer is pale brown very cherty silt loam about 11 inches thick. The subsoil is yellowish brown very cherty silty clay loam about 11 inches thick. The subsoil is yellowish brown very cherty silty clay loam to a depth of about 24 inches, strong brown very cherty silty clay loam to a depth of about 50 inches, and yellowish red, mottled very cherty silty clay loam to a depth of 72 inches or more.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid or very strongly acid throughout. Permeability is moderately rapid. The available water capacity is low. Runoff is medium, and erosion is a very severe hazard if cultivated crops are grown. Crops respond fairly well to fertilizer. However, tillage is difficult because of chert and siltstone fragments in the surface layer.

Included with this soil in mapping are a few small areas of Arkana, Captina, Gepp, and Noark soils. Also included are a few areas of soils that are similar to this Clarksville soil except that they are moderately deep to cherty limestone bedrock. Also included are a few small areas where slopes are more than 8 percent.

This soil is poorly suited to cultivated crops. The main limitations are the very severe hazard of erosion, the very cherty surface layer which interferes with tillage, and droughtiness.

This soil is moderately suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include tall fescue, bermudagrass, and lespedeza. The main limitations are coarse fragments on the surface and droughtiness.

This soil is moderately suited to use as woodland. Adapted species include white oak, shortleaf pine, sweetgum, and green ash. Seedling mortality is a moderate limitation.

This soil is well suited to most urban uses. There are no significant limitations. Slope is a moderate limitation for small commercial buildings. This limitation generally can be overcome by proper engineering design and site preparation.

This soil is in capability unit IVs-1 and in woodland suitability group 4f8.

12—Clarksville very cherty silt loam, 8 to 20 percent slopes. This is a deep, somewhat excessively drained, moderately sloping to moderately steep soil on ridgetops and adjacent side slopes in dissected hilly areas in the Ozark Highlands. Individual areas range from about 25 to 500 or more acres in size.

Typically, the surface layer is dark grayish brown very cherty silt loam about 3 inches thick. The subsurface layer is pale brown very cherty silt loam about 11 inches thick. The subsoil is yellowish brown very cherty silty clay loam to a depth of about 24 inches, strong brown very cherty silty clay loam to a depth of about 50 inches, and yellowish red, mottled very cherty silty clay loam to a depth of 72 inches or more.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to very strongly acid throughout. Permeability is moderately rapid. The available water capacity is low. Runoff is rapid, and erosion is a very severe hazard if cultivated crops are grown. Crops respond fairly well to fertilizer. Tillage is difficult because of chert fragments in the surface layer.

Included in mapping are a few small areas of Arkana, Captina, Gepp, and Noark soils. Also included are a few small areas of a soil that is similar to this Clarksville soil except that it is moderately deep to bedrock.

This soil generally is not suited to cultivated crops. The main limitations are the very severe hazard of erosion, slope, the very cherty surface layer which interferes with tillage, and droughtiness.

This soil is moderately suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include tall fescue and bermudagrass. The main limitations are coarse fragments on the surface, slope, and droughtiness.

This soil is moderately suited to use as woodland. Adapted species include white oak, shortleaf pine,

sweetgum, and green ash. The use of equipment is moderately limited, and seedling mortality is moderate.

This soil is moderately suited to most urban uses. Slope is a moderate limitation for septic tank absorption fields, dwellings, and local roads and streets. Slope is a severe limitation for small commercial buildings. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit VIs-1 and in woodland suitability group 4f8.

13—Clarksville very cherty silt loam, 20 to 40 percent slopes. This is a deep, somewhat excessively drained, steep soil on side slopes on dissected hills in the Ozark Highlands. Individual areas range from about 50 to 1,000 or more acres in size.

Typically, the surface layer is dark grayish brown very cherty silt loam about 3 inches thick. The subsurface layer is pale brown very cherty silt loam about 11 inches thick. The subsoil is yellowish brown very cherty silty clay loam to a depth of about 24 inches, strong brown very cherty silty clay loam to a depth of about 50 inches, and yellowish red, mottled very cherty silty clay loam to a depth of 72 inches or more.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid or very strongly acid throughout. Permeability is moderately rapid. The available water capacity is low. Runoff is rapid, and erosion is a very severe hazard if the soil is not protected.

Included in mapping are a few small areas of Arkana, Gepp, and Noark soils. Also included are a few small areas where slopes are more than 40 percent and a few small areas where slopes are less than 20 percent. In some small areas there are large stones and boulders.

This soil is not suited to cultivated crops. The main limitations are the very severe hazard of erosion, steep slopes, droughtiness, and the very cherty surface layer, which interferes with tillage.

This soil is poorly suited to use as pasture. Adapted pasture plants include bermudagrass, tall fescue, and weeping lovegrass. Steep slopes, droughtiness, and fragments on the surface are the main limitations.

This soil is moderately suited to use as woodland. Adapted species include shortleaf pine, red oak, sweetgum, and green ash. Erosion is a moderate hazard, the use of equipment is severely limited, and seedling mortality is severe.

This soil is poorly suited to most urban uses. Slope is a severe limitation for septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets.

This soil is in capability unit VIIs-1 and in woodland suitability group 4f9.

14—Clarksville-Udorthents complex, 20 to 40 percent slopes. This complex consists of Clarksville and Udorthents soils in areas so small and irregular in shape that they could not be mapped separately at the scale used for mapping. This complex is on steep hillsides. The mapped areas range from about 10 to 200 or more acres in size. Individual areas of each soil range from less than 1 acre to about 6 acres.

Clarksville soils make up about 45 percent of each mapped area, Udorthents make up 35 percent, and included areas make up 20 percent.

Typically, the surface layer of the Clarksville soils is dark grayish brown very cherty silt loam about 3 inches thick. The subsurface layer is pale brown very cherty silt loam about 11 inches thick. The subsoil is yellowish brown very cherty silty clay loam to a depth of about 24 inches, strong brown very cherty silty clay loam to a depth of about 50 inches, and yellowish red mottled very cherty silty clay loam to a depth of 72 inches or more.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to very strongly acid throughout. Permeability is moderately rapid. The available water capacity is low. Runoff is rapid, and erosion is a very severe hazard if the soil is not protected.

Udorthents are soils that have been altered or obscured by mining operations. The soil material ranges from silt loam to very gravelly or stony silty clay loam. Coarse fragments range from about 15 to 90 percent.

Natural fertility is low, and the content of organic matter is low. The soil is medium acid to very strongly acid throughout. Permeability is rapid. The available water capacity is low.

Included in this complex are areas of Pits and a few areas of Gepp and Noark soils. In places there are rock outcrops. Pits are long or irregularly shaped excavations from which soil and rock material have been removed.

The soils making up this complex are not suited to cultivated crops. The main limitations are a very severe hazard of erosion, steep slopes, droughtiness, and coarse fragments on the surface, which interfere with tillage.

These soils are poorly suited to use as pasture. Adapted pasture plants include bermudagrass, tall fescue, and weeping lovegrass. Steep slopes, droughtiness, and fragments on the surface are significant limitations.

The soils are used mainly as woodland and as habitat for wildlife. The trees are dominantly low-grade hardwoods and cedars. Clarksville soils are moderately suited to use as woodland. Adapted species include shortleaf pine, eastern redcedar, red oak, and post oak. The use of equipment is severely limited, and seedling mortality is high. Udorthents are poorly suited to use as woodland. The main adapted species is eastern redcedar. The use of equipment is severely limited, erosion is a severe hazard, and seedling mortality is high.

The soils are poorly suited to most urban uses. Slope is a severe limitation for septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets.

The soils are in capability unit VIIs-1. Clarksville soils are in woodland suitability group 4f9. Udorthents are not assigned to a woodland group.

15—Crowley silt loam, 0 to 1 percent slopes. This is a deep, level, somewhat poorly drained soil on broad flats on terraces. Individual areas range from about 50 to more than 450 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsurface layer is gray, mottled silt loam; it extends to a depth of about 20 inches. The subsoil is grayish brown, mottled silty clay to a depth of about 40 inches and light brownish gray, mottled silty clay loam to a depth of about 52 inches. The underlying material is mottled light brownish gray, yellowish brown, and strong brown silty clay loam to a depth of 72 inches or more.

Natural fertility is moderate, and the content of organic matter is low. The surface layer and the upper part of the subsoil are slightly acid to very strongly acid, and the lower part of the subsoil and the underlying material are mildly alkaline to medium acid. Permeability is very slow. The available water capacity is high. This soil has a water table perched within 18 inches of the surface late in winter and early in spring. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Amagon, Foley, and Forestdale soils and a few small areas of soils that are similar to this Crowley soil except that they do not have red mottles. Also included are a few small areas where the upper part of the subsoil is neutral or mildly alkaline.

This soil is well suited to rice and soybeans and is used mainly for these crops. Wetness is the main limitation. Other adapted crops include grain sorghum and winter small grains. Surface drains are needed. In the spring, wetness can delay planting for several days.

This soil is well suited to pasture and hay. Adapted pasture plants include common bermudagrass, tall fescue, and white clover. The main limitation is wetness late in winter and early in spring. This limitation can be overcome by harvesting and grazing during the drier seasons.

This soil is well suited to use as woodland. Adapted species include green ash, cherrybark oak, water oak, and sweetgum. Wetness restricts the use of logging equipment. Special equipment can be used, or logging can be done during the drier seasons.

This soil is poorly suited to most urban uses. Wetness and the very slow permeability are severe limitations for septic tank filter fields. Wetness and the high shrink-swell potential are severe limitations for dwellings, small commercial buildings, and local roads and streets. Low strength is a severe limitation for local roads and streets. These limitations generally are difficult or impractical to overcome.

This soil is in capability unit IIIw-1 and in woodland suitability group 3w9.

16—Dubbs silt loam, gently undulating. This is a deep, well drained soil on natural levees or low terraces along abandoned stream channels on bottom lands of the White and Black Rivers. Individual areas range from about 25 to 275 acres in size. Slopes are 0 to 3 percent.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil in the upper part is dark brown silty clay loam; in the middle part it is dark brown, mottled silty clay loam; and in the lower part it is dark brown mottled loam. The underlying material is yellowish brown, mottled loam to a depth of 72 inches or more.

Natural fertility is moderate, and the content of organic matter is low. This soil is medium acid to very strongly acid throughout. Permeability is moderate. The available water capacity is high. Crops on this soil respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Arrington, Askew, and Foley soils. Also included are a few small areas where the surface layer is fine sandy loam and the subsoil is sandy clay loam.

This soil is well suited to row crops and winter small grains, and it is used mainly as cropland. The main crop is soybeans. Other adapted crops include wheat, cotton, and corn. Erosion is a moderate hazard in the more sloping areas. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. Drainage may be needed in depressed areas to remove excess water.

This soil is well suited to pasture and hay. Adapted pasture plants include bermudagrass, lespedeza, and tall fescue.

This soil is well suited to use as woodland. Adapted species include eastern cottonwood, green ash, cherrybark oak, sweetgum, and American sycamore. There are no significant limitations.

This soil is well suited to most urban uses. There are no significant limitations.

This soil is in capability unit IIe-2 and in woodland suitability group 2o4.

17—Egam silt loam, 0 to 1 percent slopes. This is a deep, level, moderately well drained soil on bottom lands along the White River. It is rarely flooded. Individual areas range from about 40 to 1,000 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 7 inches thick. The layer below that is very dark grayish brown mottled silty clay loam about 20 inches thick. The subsoil is very dark grayish brown and dark brown, mottled silty clay loam to a depth of 72 inches or more.

Natural fertility is high, and the content of organic matter is medium. The surface layer and the upper part of the subsoil are neutral to medium acid, and the lower part of the subsoil is moderately alkaline to medium acid. Permeability is moderately slow. The available water capacity is high. This soil has a high water table within 3 to 4 feet of the surface late in winter and early in spring. If surface drains are not installed, farm operations are often delayed for a few days after a rain. In most areas, impoundments on the White River protect the soil from flooding. Nevertheless, flooding occurs on rare occasions. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Arrington, Dubbs, and Wideman soils. Also included are a few small areas of soils that are similar to this Egam soil except that they do not have a dark surface layer.

This soil is well suited to most cultivated crops. It is used mainly for rice and soybeans. Other adapted crops include grain sorghum, corn, cotton, winter small grains, and alfalfa. Wetness is the main limitation.

This soil is well suited to pasture and hay. Adapted pasture plants include bermudagrass, tall fescue, white clover, and alfalfa. Wetness late in winter and early in spring is the main limitation.

This soil is well suited to use as woodland. Adapted species include black walnut, southern red oak, and water oak. There are no significant limitations.

This soil is poorly suited to most urban uses. The moderately slow permeability and wetness are severe limitations for septic tank filter fields. Rare flooding is a severe limitation for dwellings and small commercial buildings. Low strength is a severe limitation for local roads and streets. These limitations generally are difficult or impractical to overcome.

This soil is in capability unit IIw-1 and in woodland suitability group 2o4.

18—Egam silty clay loam, occasionally flooded. This is a deep, level to nearly level, moderately well drained soil on bottom lands of the White River and its tributaries. It is occasionally flooded. Slopes are 0 to 2 percent. Individual areas range from about 20 to 200 acres in size.

Typically, the surface layer is very dark grayish brown silty clay loam about 7 inches thick. The layer below that is very dark grayish brown mottled silty clay loam about 20 inches thick. The subsoil is very dark grayish brown and dark brown, mottled silty clay loam to a depth of 72 inches or more.

Natural fertility is high, and the content of organic matter is medium. The surface layer and upper part of the subsoil are neutral to medium acid, and the lower part of the subsoil is moderately alkaline to medium acid. Permeability is moderately slow. The available water capacity is high. Crops respond well to fertilizer. Clods form on the surface if the soil is tilled when wet. This soil has a high water table within 3 to 4 feet of the surface late in winter and early in spring.

Included with this soil in mapping are a few small areas of Arrington, Forestdale, and Jackport soils. Also included are a few small areas where the surface layer is silt loam and areas where the soil is not flooded.

This soil is well suited to most cultivated crops. It is used mainly for soybeans. Other adapted crops include rice and grain sorghum. Surface drains are needed in some areas. In spring, ponding and wetness can delay planting for several days. The main limitations are the hazard of occasional flooding and wetness.

This soil is well suited to pasture and hay. Adapted pasture plants include alfalfa, improved bermudagrass, clover, and fescue. The main limitations are occasional flooding late in winter and early in spring and wetness. Grazing and haying can be done in the drier seasons.

This soil is well suited to use as woodland. Adapted species include black walnut, southern red oak, and water oak. There are no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Flooding, the moderately slow permeability, and wetness are severe limitations for septic tank filter fields. Flooding is a severe limitation for dwellings and small commercial buildings. Flooding and low strength are severe limitations for local roads and streets. These limitations are difficult or impractical to overcome.

This soil is in capability unit IIw-1 and in woodland suitability group 2o4.

19—Enders fine sandy loam, 3 to 8 percent slopes. This is a deep, well drained, gently sloping soil in the Boston Mountains. It is on side slopes and ridgetops of dissected plateaus and mountains. Individual areas range from about 25 to 125 or more acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 2 inches thick. The subsurface layer is brown fine sandy loam about 6 inches thick. The subsoil is red clay to a depth of about 24 inches; red, mottled clay to a depth of about 44 inches; and mottled red, gray, and brown clay to a depth of 58 inches. The underlying material is partly weathered shale and siltstone bedrock to a depth of 60 inches or more.

Natural fertility is low, and the content of organic matter is low. The soil is strongly acid to extremely acid throughout. Permeability is very slow. The available water capacity is medium. Runoff is medium, and erosion is a very severe hazard if cultivated crops are grown. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Linker and Sidon soils and soils that are similar to this Enders soil except that they have gray mottles in the upper part of the subsoil. Also included are small

areas where the soil has gravel and stones on the surface.

This soil is poorly suited to cultivated crops. A very severe hazard of erosion is the main limitation.

This soil is moderately suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include common bermudagrass and tall fescue. There are no significant limitations.

This soil is moderately suited to use as woodland. Adapted species include red oak, white oak, shortleaf pine, and loblolly pine. There are no significant limitations.

This soil is poorly suited to most urban uses. The very slow permeability is a severe limitation for septic tank filter fields. The high shrink-swell potential is a severe limitation for dwellings and small commercial buildings. Low strength and the high shrink-swell potential are severe limitations for local roads and streets. These limitations are difficult or impractical to overcome.

This soil is in capability unit IVe-1 and in woodland suitability group 4o1.

20—Enders fine sandy loam, 8 to 12 percent slopes. This is a deep, well drained, moderately sloping soil in the Boston Mountains. It is on side slopes and ridgetops of dissected plateaus and mountains. Individual areas range from about 25 to 475 acres or more in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 2 inches thick. The subsurface layer is brown fine sandy loam about 6 inches thick. The subsoil is red clay to a depth of about 24 inches; red, mottled clay to a depth of about 44 inches; and mottled red, gray, and brown clay to a depth of 58 inches. Partly weathered shale and siltstone are below a depth of 58 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to extremely acid throughout. Permeability is very slow. The available water capacity is medium. Runoff is rapid, and erosion is a very severe hazard if crops are grown. Grasses respond well to fertilizer.

Included with this soil in mapping are a few small areas of Linker and Sidon soils and soils that are similar to this Enders soil except that they have gray mottles in the upper part of the subsoil. Also included are a few small areas of soils that are 72 or more inches deep to bedrock and soils that have gravel and stones on the surface.

This soil generally is not suited to cultivated crops because of the very severe hazard of erosion.

This soil is moderately suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include common bermudagrass and tall fescue. There are no significant limitations.

This soil is moderately suited to use as woodland. Adapted species include loblolly pine, shortleaf pine, eastern redcedar, southern red oak, and white oak. There are no significant limitations.

This soil is poorly suited to most urban uses. The very slow permeability is a severe limitation for septic tank filter fields. The high shrink-swell potential is a severe limitation for dwellings and small commercial buildings. Slope is a severe limitation for small commercial buildings. Low strength and the high shrink-swell potential are severe limitations for local roads and streets. These limitations are difficult or impractical to overcome.

This soil is in capability unit VIe-3 and in woodland suitability group 4o1.

21—Enders stony fine sandy loam, 8 to 20 percent slopes. This is a deep, well drained, moderately sloping to moderately steep soil in the Boston Mountains. It is on side slopes of dissected plateaus and mountains. Individual areas range from about 20 to 600 acres or more in size.

Typically, the surface layer is very dark grayish brown stony fine sandy loam about 2 inches thick. The subsurface layer is brown stony fine sandy loam about 8 inches thick. The subsoil is red clay to a depth of about 24 inches; red, mottled clay to a depth of about 44 inches; and mottled red, gray, and brown clay to a depth of 58 inches. Partly weathered shale and siltstone are below a depth of 58 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to extremely acid throughout. Permeability is very slow. The available water capacity is medium. Runoff is rapid, and erosion is a very severe hazard if the soil is not protected.

Included with this soil in mapping are a few small areas of Linker, Mountainburg, and Sidon soils and a few small areas of a soil that has gray mottles in the upper part of the subsoil. In a few small areas there are rock outcrops.

This soil generally is not suited to cultivated crops because of the very severe hazard of erosion and stones on the surface, which interfere with tillage.

This soil is poorly suited to use as pasture. Steep slopes and stones on the surface are limitations. Adapted pasture plants include common bermudagrass and tall fescue.

This soil is moderately suited to use as woodland, and it is used mainly as woodland. Adapted species include loblolly pine, shortleaf pine, southern red oak, white oak, and eastern redcedar. Large stones on the surface and steep slopes are moderate limitations.

This soil is poorly suited to most urban uses. The very slow permeability is a severe limitation for septic tank absorption fields. The high shrink-swell potential is a severe limitation for dwellings. The high shrink-swell potential and slope are severe limitations for small commercial buildings. Low strength and the high shrink-swell potential are severe limitations for local roads and

streets. These limitations are difficult or impractical to overcome.

This soil is in capability unit VIs-1 and in woodland suitability group 4x2.

22—Enders stony fine sandy loam, 20 to 45 percent slopes. This is a deep, well drained, steep to very steep soil in the Boston Mountains. It is on side slopes on dissected mountains and plateaus. Individual areas range from about 40 to 800 acres in size.

Typically, the surface layer is very dark grayish brown stony fine sandy loam about 2 inches thick. The subsurface layer is brown stony fine sandy loam about 8 inches thick. The subsoil is red clay to a depth of about 24 inches; red, mottled clay to a depth of about 44 inches; and mottled red, gray, and brown clay to a depth of 58 inches. Partly weathered shale and siltstone are below a depth of 58 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to extremely acid throughout. Permeability is very slow. The available water capacity is medium. Runoff is rapid, and erosion is a very severe hazard if the soil is not protected.

Included with this soil in mapping are a few small areas of Linker and Mountainburg soils. Also included are areas of a soil that is similar to this Enders soil except that its subsoil is more than 35 percent, by volume, shale fragments. In some areas there are vertical sandstone bluffs.

This soil is not suited to cultivated crops or pasture because of stones on the surface, steep slopes, and a very severe hazard of erosion.

This soil is poorly suited to use as woodland. However, it is used mainly as woodland. Adapted species include loblolly pine, shortleaf pine, eastern redcedar, southern red oak, and white oak. Large stones on the surface and steep slopes are severe limitations.

This soil is poorly suited to most urban uses. The very slow permeability and slope are severe limitations for septic tank absorption fields. The high shrink-swell potential and slope are severe limitations for dwellings and small commercial buildings. Low strength, slope, and the high shrink-swell potential are severe limitations for local roads and streets. These limitations are difficult or impractical to overcome.

This soil is in capability unit VIIs-1 and in woodland suitability group 5r3.

23—Foley silt loam, 0 to 1 percent slopes. This is a deep, poorly drained, level soil on terraces and broad flats. Individual areas range from about 10 to 60 acres in size.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 4 inches thick. The subsoil is grayish brown, mottled silty clay loam to a depth of about 23 inches; dark grayish brown and grayish brown, mottled silty clay loam to a depth of about 54 inches; and pale brown, mottled silt loam to a depth of 72 inches or more.

Natural fertility is moderate, and the content of organic matter is low. The surface layer is neutral to very strongly acid, the upper part of the subsoil is neutral to strongly acid, and the lower part of the subsoil is strongly alkaline to neutral. Permeability is very slow. The available water capacity is medium to low. The water table is perched within 1 foot of the surface late in winter and early in spring. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Amagon, Crowley, Dubbs, Askew, and Forestdale soils. Also included are a few small areas where the soil is flooded occasionally and a few small areas where the soil has a high concentration of sodium directly below the surface layer.

This soil is moderately suited to cultivated crops. In most areas it is used for cultivated crops, mainly soybeans. Rice and grain sorghum also are grown on this soil. Surface runoff is slow. Excess water on the surface can delay farming operations for several days after a rain unless surface drains are installed. Droughtiness is a hazard during periods of low rainfall. The high content of sodium and magnesium in the subsoil is a severe limitation if cuts are made and may have adverse affects on crop production.

This soil is well suited to use as pasture. Wetness in winter and spring is the main limitation. Adapted pasture plants include common bermudagrass, tall fescue, and white clover.

The soil is well suited to use as woodland. Adapted species include sweetgum, cherrybark oak, and water oak. Wetness is the main limitation, but logging can be done during the drier seasons.

This soil is poorly suited to most urban uses. Wetness is a severe limitation for dwellings, local roads and streets, and small commercial buildings. Low strength is a severe limitation for local roads and streets. The very slow permeability and wetness are severe limitations for septic tank filter fields. These limitations are difficult or impractical to overcome.

This soil is in capability unit IIIw-1 and in woodland suitability group 3w6.

24—Forestdale silt loam, frequently flooded. This is a deep, poorly drained, level soil on the lower part of natural levees on bottom lands of the Black and White Rivers. Slopes are 0 to 1 percent. Individual areas range from 25 to 600 or more acres in size.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsoil is light brownish gray, mottled silty clay to a depth of about 15 inches and gray, mottled silty clay and silty clay loam to a depth of about 70 inches. The underlying material is light

brownish gray, mottled silty clay loam to a depth of 80 inches or more.

Natural fertility is moderate, and the content of organic matter is low. The surface layer and the upper part of the subsoil are slightly acid to very strongly acid, and the lower part of the subsoil and the underlying material are mildly alkaline to strongly acid. Permeability is very slow. The available water capacity is medium. The water table is within 6 to 24 inches of the surface late in winter and early in spring. Most areas of this soil are flooded more than once every 2 years for long periods late in winter and early in spring. Crops on this soil respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Amagon, Askew, Crowley, and Foley soils. Also included are small areas where the surface layer is silty clay loam and areas where the soil is flooded less often than is normal.

This soil is moderately suited to crops that have a short growing season. It is used mainly as cropland. The principal crops are rice and soybeans (fig. 6). Flooding is a severe hazard from December to April in most years, and only warm-season annual crops that have a short growing season can be grown. If the soils are well managed, crops that leave a large amount of residue can be grown in most years. However, flooding is likely to damage crops in some years.

This soil is moderately suited to use as pasture. Adapted pasture plants include common bermudagrass and legumes. Wetness and flooding are severe limitations late in winter and early in spring. These limitations can be overcome by scheduling grazing and haying during the drier seasons.

This soil is well suited to use as woodland. Adapted species include green ash, eastern cottonwood, cherrybark oak, Nuttall oak, water oak, willow oak, and sweetgum. Wetness severely limits the use of equipment, but logging can be done during the drier seasons.

This soil is severely limited for most urban uses. Flooding, wetness, and the very slow permeability are severe limitations for septic tank absorption fields. Flooding, wetness, and the high shrink-swell potential are severe limitations for dwellings, small commercial buildings, and local roads and streets. These limitations are very difficult or impractical to overcome.

This soil is in capability unit IVw-1 and in woodland suitability group 1w6.

25—Gepp very cherty silt loam, 3 to 8 percent slopes. This is a deep, well drained, gently sloping soil on ridgetops and side slopes in the Ozark Highlands. Individual areas range from about 10 to 100 acres in size.

Typically, the surface layer is very dark grayish brown very cherty silt loam about 4 inches thick. The subsurface layer is yellowish brown very cherty silt loam about 8 inches thick. The subsoil is red silty clay to a depth of about 23 inches and red, mottled clay to a

Figure 6.—Rice about ready for harvest on Forestdale silt loam, frequently flooded. Because of the hazard of flooding, this soil is used mainly for crops that have a short growing season.

depth of about 65 inches. Cherty limestone bedrock that has cracks filled with red clay is below a depth of 65 inches.

Natural fertility is low, and the content of organic matter is low. The surface and subsurface layers are slightly acid to strongly acid, the upper part of the subsoil is medium acid to very strongly acid, and the lower part of the subsoil is medium acid to strongly acid. Permeability is moderate. The available water capacity is medium. Runoff is medium, and erosion is a very severe hazard if cultivated crops are grown. Crops on this soil respond well to fertilizer. However, tillage is difficult because of the chert fragments in the surface layer.

Included with this soil in mapping are a few small areas of Arkana, Clarksville, Moko, and Noark soils. Also included are a few small areas where the surface layer is silt loam and a few small areas where slopes are more than 8 percent.

This soil is poorly suited to cultivated crops. The main limitations are the very severe hazard of erosion and the chert fragments in the surface layer that interfere with tillage.

This soil is moderately suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include common bermudagrass and tall fescue. The main limitation is the coarse fragments.

This soil is well suited to use as woodland. Adapted species are yellow-poplar, black walnut, white oak, shortleaf pine, loblolly pine, and black oak. There are no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. The moderate permeability is a moderate limitation for septic tank absorption fields. The moderate shrink-swell potential is a moderate limitation for dwellings and small commercial buildings. Slope is a moderate limitation for small commercial buildings. Low strength is a severe limitation for local streets and roads. These limitations generally can be partly overcome by proper engineering design.

This soil is in capability unit IVe-3 and in woodland suitability group 3o7.

26—Gepp very cherty silt loam, 8 to 12 percent slopes. This is a deep, well drained, moderately sloping soil on side slopes and narrow ridgetops in the Ozark Highlands. Individual areas range from 25 to 350 acres in size.

Typically, the surface layer is very dark grayish brown very cherty silty loam about 4 inches thick. The subsurface layer is yellowish brown very cherty silt loam about 8 inches thick. The subsoil is red silty clay to a depth of about 23 inches and red, mottled clay to a depth of about 65 inches. Cherty limestone bedrock that has cracks filled with red clay is below a depth of 65 inches.

Natural fertility is low, and the content of organic matter is low. The surface and subsurface layers are slightly acid to strongly acid, the upper part of the subsoil is medium acid to very strongly acid, and the lower part of the subsoil is medium acid to strongly acid. Permeability is moderate. The available water capacity is medium. Runoff is medium to rapid, and erosion is a very severe hazard if cultivated crops are grown. Tillage is difficult because of the chert fragments in the surface layer.

Included with this soil in mapping are a few small areas of Arkana, Clarksville, Moko, and Noark soils. Also included are a few small areas where slopes are less than 8 percent and a few small areas where they are more than 12 percent.

This soil is not suited to cultivated crops because of the very severe hazard of erosion and the coarse fragments on the surface.

This soil is moderately suited to use as pasture. Slope and chert fragments on the surface are limitations. Adapted pasture plants include common bermudagrass and tall fescue.

This soil is well suited to use as woodland. Adapted species are yellow-poplar, black oak, white oak, shortleaf pine, and loblolly pine. There are no significant limitations to woodland use and management.

This soil is moderately suited to poorly suited to most urban uses. The moderate permeability and slope are moderate limitations for septic tank absorption fields. The moderate shrink-swell potential and slope are moderate limitations for dwellings. Slope is a severe limitation for small commercial buildings. Low strength is a severe limitation for local roads and streets. These limitations generally can be partly overcome by proper engineering design.

This soil is in capability unit VIe-3 and in woodland suitability group 3o7.

27—Gepp very cherty silt loam, 12 to 30 percent slopes. This is a deep, well drained, moderately steep to steep soil on side slopes in the Ozark Highlands. Individual areas range from about 20 to more than 1,000 acres in size.

Typically, the surface layer is very dark grayish brown very cherty silt loam about 4 inches thick. The subsurface layer is yellowish brown very cherty silt loam about 8 inches thick. The subsoil is red silty clay to a depth of about 23 inches and red, mottled clay to a depth of about 65 inches. Cherty limestone bedrock that has cracks filled with red clay is below a depth of 65 inches.

Natural fertility is low, and the content of organic matter is low. The surface and subsurface layers are slightly acid to strongly acid, the upper part of the subsoil is medium acid to very strongly acid, and the lower part of the subsoil is medium acid to strongly acid. Permeability is moderate. The available water capacity is medium. Runoff is medium to rapid, and erosion is a very severe hazard if cultivated crops are grown. Tillage is

difficult because of the chert fragments in the surface layer.

Included with this soil in mapping are a few small areas of Arkana, Clarksville, Moko, and Noark soils. Also included is a small area where slopes are less than 12 percent.

This soil is not suited to cultivated crops because of the very severe hazard of erosion and the coarse fragments on the surface.

This soil is poorly suited to pasture. Steep slopes and chert fragments on the surface are limitations. Adapted pasture plants include bermudagrass and tall fescue.

This soil is well suited to use as woodland, and it is used mainly as woodland. Adapted species are white oak, shortleaf pine, loblolly pine, northern red oak, and black walnut. There are no significant limitations to woodland use and management.

This soil is poorly suited to urban uses. Slope is a severe limitation for septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets. Low strength is a severe limitation for local roads and streets. These limitations are difficult or impractical to overcome.

This soil is in capability unit VIIe-1 and in woodland suitability group 3o7.

28—Hontas silt loam, occasionally flooded. This is a deep, moderately well drained, level soil on flood plains along streams that drain the Ozark Highlands. Individual areas range from 50 to 450 acres in size.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The layer below that is dark brown silt loam about 7 inches thick. The subsoil is brown, mottled silty clay loam to a depth of about 22 inches and grayish brown, mottled silty clay loam to a depth of about 39 inches. The underlying material is gray, mottled silty clay loam to a depth of 72 inches or more.

Natural fertility is moderate, and the content of organic matter is low. The surface and subsurface layers are neutral to medium acid, and the subsoil and underlying material are mildly alkaline to medium acid. Permeability is moderate. The available water capacity is high. An apparent water table is within 24 to 30 inches of the surface late in winter and early in spring. There is occasional flooding in winter and early in spring. Crops on this soil respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Arrington and Egam soils. Also included are a few areas where the upper part of the subsoil is grayer than that of this Hontas soil and a few small areas where the soil is not flooded.

This soil is well suited to cultivated crops. The principal crop is soybeans. In a few areas the soil is used for small grains and hay crops. The main limitations are the hazard of occasional flooding and wetness. If surface drains are not installed, farming operations are often delayed a few days after a rain. If good management is practiced, clean-tilled crops that leave a large amount of residue can be grown safely year after year.

This soil is well suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include tall fescue, bermudagrass, and clover. The main limitations are wetness and the hazard of flooding. These limitations generally can be overcome by scheduling haying and grazing during the drier seasons.

This soil is well suited to use as woodland. Adapted species include shortleaf pine, loblolly pine, black walnut, eastern cottonwood, sycamore, and sweetgum. There are no significant limitations.

This soil is poorly suited to urban uses. Flooding is a severe limitation for dwellings, commercial buildings, septic tank absorption fields, and local roads and streets. Wetness is a severe limitation for septic tank filter fields. These limitations are difficult or impractical to overcome.

This soil is in capability unit IIw-1 and in woodland suitability group 2o7.

29—Jackport silty clay loam, 0 to 1 percent slopes. This is a deep, poorly drained, level soil on broad flat terraces that are backswamps of former streams. Individual areas range from 25 to 400 acres or more in size.

Typically, the surface layer is dark grayish brown silty clay loam about 5 inches thick. The subsurface layer is gray, mottled silty clay loam about 7 inches thick. The subsoil is grayish brown, mottled clay to a depth of about 26 inches; dark grayish brown, mottled clay to a depth of about 38 inches; and grayish brown, mottled clay and silty clay to a depth of 72 inches or more.

Natural fertility is moderate, and the content of organic matter is low. The surface and subsurface layers are slightly acid to very strongly acid, the subsoil is strongly acid or very strongly acid, and the underlying material is neutral to strongly acid. Permeability is very slow. The available water capacity is medium. This soil has a water table perched within 1 foot of the surface late in winter and early in spring. Crops respond well to fertilizer. However, tilth is difficult to maintain, and clods form if the soil is plowed when wet.

Included with this soil in mapping are small areas of Amagon, Askew, Crowley, and Forestdale soils.

This soil is well suited to crops such as rice and soybeans. Most of the acreage is in these crops. A small acreage is in small grains and grain sorghum. Wetness is the main limitation. Fieldwork is often delayed several days after a rain if surface drains to prevent ponding are not installed. Under good management, including adequate drainage, this soil can be used safely year after year for clean-tilled crops that leave a large amount of residue on the surface.

This soil is well suited to use as pasture. Adapted pasture plants include common bermudagrass and tall

fescue. The main management problem is wetness late in winter and early in spring.

This soil is well suited to use as woodland. Adapted species include green ash, cherrybark oak, eastern cottonwood, sycamore, water oak, willow oak, and sweetgum. Wetness limits the use of equipment. However, special equipment can be used, or logging can be done during the drier seasons.

This soil is poorly suited to most urban uses. Wetness and the very slow permeability are severe limitations for septic tank absorption fields. Wetness and the high shrink-swell potential are severe limitations for dwellings and small commercial buildings. Low strength, wetness, and the high shrink-swell potential are severe limitations for roads and streets. These limitations are difficult or impractical to overcome.

This soil is in capability unit IIIw-2 and in woodland suitability group 2w6.

30—Lily fine sandy loam, 3 to 8 percent slopes. This is a moderately deep, well drained, gently sloping soil on upland ridges and side slopes in the Ozark Highlands. Individual areas range from about 25 to 175 acres in size.

Typically, the surface layer is brown fine sandy loam about 4 inches thick. The subsoil is yellowish brown fine sandy loam to a depth of about 11 inches, strong brown loam to a depth of about 16 inches, yellowish red loam to a depth of about 23 inches, and strong brown, mottled sandy clay loam to a depth of about 38 inches. Level-bedded acid sandstone bedrock is below a depth of 38 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to extremely acid throughout. Permeability is moderately rapid. The available water capacity is medium. Runoff is medium, and erosion is a severe hazard. Grasses respond well to fertilizer on this soil.

Included with this soil in mapping are a few small areas of Boden, Brockwell, and Portia soils. Also included are a few small areas where bedrock is at a depth of less than 20 inches and the lower part of the subsoil is gravelly. There are rock outcrops in a few small areas.

This soil is moderately suited to cultivated crops. Erosion is a severe limitation. Soybeans, wheat, and other crops can be grown in the less sloping areas if minimum tillage, contour farming, cover crops, and other conservation practices are used.

This soil is well suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include common bermudagrass and tall fescue.

This soil is moderately suited to use as woodland. Adapted species include white oak, red oak, shortleaf pine, and loblolly pine. There are no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. The moderate depth to rock is a severe limitation for septic tank absorption fields. The moderate depth to rock is a moderate limitation for dwellings, small commercial buildings, and local roads and streets. Slope is a moderate limitation for small commercial buildings. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IIIe-1 and in woodland suitability group 4o7.

31—Lily fine sandy loam, 8 to 12 percent slopes. This is a moderately deep, well drained, moderately sloping soil on upland ridges and side slopes in the Ozark Highlands. Individual areas range from about 40 to 250 acres in size.

Typically, the surface layer is brown fine sandy loam about 4 inches thick. The subsoil is yellowish brown fine sandy loam to a depth of about 11 inches, strong brown loam to a depth of about 16 inches, yellowish red loam to a depth of about 23 inches, and strong brown, mottled sandy clay loam to a depth of about 38 inches. Level-bedded acid sandstone bedrock is below a depth of 38 inches.

Natural fertility is low, and the content of organic matter is low. The soil is strongly acid to extremely acid throughout. Permeability is moderately rapid. The available water capacity is medium. Runoff is rapid, and erosion is a severe hazard.

Included with this soil in mapping are a few small areas of Boden, Brockwell, and Portia soils. Also included are a few small areas where bedrock is at a depth of less than 20 inches. There are rock outcrops in a few small areas.

This soil is poorly suited to cultivated crops because runoff is rapid and erosion is a severe hazard.

This soil is moderately suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include common bermudagrass and tall fescue.

This soil is moderately suited to use as woodland. Adapted species include white oak, red oak, shortleaf pine, and loblolly pine. There are no significant limitations.

This soil is moderately suited to poorly suited to most urban uses. The moderate depth to rock is a severe limitation for septic tank absorption fields. The moderate depth to rock and slope are moderate limitations for dwellings and local roads and streets. Slope is a severe limitation for small commercial buildings. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IVe-1 and in woodland suitability group 4o7.

32—Lily-Ramsey-Rock outcrop complex, 8 to 30 percent slopes. This complex consists of moderately sloping to steep Lily and Ramsey soils and Rock outcrop

on upland ridges and side slopes. The areas of each are so intermingled that it was not practical to map them separately at the scale used for mapping. The mapped areas range from 10 to 100 acres in size.

Lily fine sandy loam makes up about 40 percent of each mapped area. Ramsey fine sandy loam makes up about 30 percent, Rock outcrop makes up 15 percent, and other soils make up 15 percent.

Typically, the surface layer of the Lily soil is brown fine sandy loam about 4 inches thick. The subsoil is yellowish brown fine sandy loam to a depth of 11 inches, strong brown loam to a depth of 16 inches, yellowish red loam to a depth of 23 inches, and strong brown, mottled sandy clay loam to a depth of about 38 inches. Hard acid sandstone bedrock is below a depth of 38 inches.

Natural fertility of the Lily soil is low, and the content of organic matter is low. The soil is strongly acid to extremely acid throughout. Permeability is moderately rapid. The available water capacity is medium.

Typically, the surface layer of the Ramsey soil is dark brown fine sandy loam about 2 inches thick. The subsurface layer is brown fine sandy loam about 3 inches thick. The subsoil is yellowish brown fine sandy loam about 9 inches thick. Below that, level-bedded acid sandstone bedrock extends to a depth of 16 inches or more.

Natural fertility of the Ramsey soil is low, and the content of organic matter is low. The soil is strongly acid or very strongly acid throughout. Permeability is rapid. The available water capacity is low.

Rock outcrop consists of hard acid sandstone. In some areas the exposed sandstone is in the form of large boulders.

Included with this complex in mapping are small areas of soils that are 2 to 7 inches thick over sandstone bedrock and small areas of Brockwell, Boden, and Portia soils.

The soils making up this complex are not suited to cultivated crops and are poorly suited to use as pasture. Depth to bedrock, stones on the surface, and rock outcrops restrict the soils to use only as wildlife habitat, rangeland, woodland or for recreation uses. The soils should not be cleared. Erosion is a very severe hazard if the native vegetation is removed.

The soils are moderately suited to poorly suited to use as woodland. Adapted species include shortleaf pine, loblolly pine, and eastern redcedar. Presently, the soils are used mainly as woodland. Low-grade scrub cedar, pine, and hardwoods are scattered among sparse stands of native prairie plants, shrubs, lichens, mosses, and cacti and other succulents. Large stones and boulders limit the use of logging equipment. Steep slopes are an additional limitation to woodland use and management.

The soils are poorly suited to most urban uses. Depth to rock and slope are severe limitations for septic tank absorption fields. They also are limitations for dwellings, small commercial buildings, and local roads and streets. These limitations generally are difficult or impractical to overcome.

Lily and Ramsey soils are in capability unit VIe-1. The Lily soil is in woodland suitability group 4r8, and the Ramsey soil is in woodland group 4d2. Rock outcrop is not assigned to a capability unit or woodland group.

33—Linker fine sandy loam, 3 to 8 percent slopes. This is a moderately deep, well drained, gently sloping soil on broad plateaus, side slopes, and ridgetops. Individual areas range from about 10 to 150 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 5 inches thick. The subsoil is strong brown fine sandy loam to a depth of about 9 inches, yellowish red loam to a depth of about 24 inches, and yellowish red, mottled gravelly sandy clay loam to a depth of about 30 inches. Hard level-bedded acid sandstone is below a depth of 30 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to very strongly acid throughout. Permeability is moderate. The available water capacity is medium. Runoff is medium, and erosion is a severe hazard. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Enders, Mountainburg, and Sidon soils. Also included are a few small areas where the soil has a gravelly surface layer and areas where slopes are less than 3 percent. Also included are areas of a soil that is similar to Linker soils except that it is more than 40 inches deep to bedrock.

This soil is moderately suited to cultivated crops. Adapted crops include wheat, corn, and soybeans. This soil is also suited to strawberries, cucumbers, squash, peas, beans, melons, and other truck crops. Erosion is a severe hazard. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. Conservation practices need to be intensified as the length and grade of the slope increase.

This soil is well suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include common bermudagrass and tall fescue. There are no significant limitations.

This soil is moderately suited to use as woodland. Adapted species include shortleaf pine, loblolly pine, southern red oak, and white oak. There are no significant limitations.

This soil is moderately suited to most urban uses. The moderate depth to rock is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. The moderate depth to rock is a moderate limitation for dwellings, small commercial buildings, and local roads and streets. Slope is a moderate limitation for small commercial buildings. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IIIe-1 and in woodland suitability group 4o7.

34—Linker fine sandy loam, 8 to 12 percent slopes. This is a moderately deep, well drained, moderately sloping soil on side slopes. Individual areas range from about 10 to 250 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam about 5 inches thick. The subsoil is strong brown fine sandy loam to a depth of about 9 inches, yellowish red loam to a depth of about 24 inches, and yellowish red, mottled gravelly sandy clay loam to a depth of about 30 inches. Hard level-bedded acid sandstone extends to a depth of 32 inches or more.

This soil is low in natural fertility and low in content of organic matter. It is strongly acid to very strongly acid throughout. Permeability is moderate. The available water capacity is medium. Runoff is rapid, and erosion is a very severe hazard. Grasses on this soil respond well to fertilizer.

Included with this soil in mapping are a few small areas of Enders, Mountainburg, and Sidon soils. Also included are a few small areas where the soil has a gravelly and stony surface layer and a few small areas where the soil is more than 40 inches deep to bedrock.

This soil is poorly suited to cultivated crops because runoff is rapid and erosion is a very severe hazard. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

This soil is well suited to use as pasture, and it is used mainly as pasture. There are no significant limitations. The adapted pasture plants are common bermudagrass and tall fescue.

This soil is moderately suited to use as woodland. There are no significant limitations. Adapted species are shortleaf pine, loblolly pine, southern red oak, and white oak.

This soil is moderately suited to poorly suited to most urban uses. Moderate depth to rock is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. Slope is a severe limitation for small commercial buildings. Slope and the moderate depth to rock are moderate limitations for dwellings and local roads and streets. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IVe-1 and in woodland suitability group 4o7.

35—Linker gravelly fine sandy loam, 3 to 8 percent slopes. This is a moderately deep, well drained, gently sloping soil on broad plateaus, side slopes, and ridgetops. Individual areas range from about 10 to 500 acres in size.

Typically, the surface layer is very dark grayish brown gravelly fine sandy loam about 4 inches thick. The subsoil is strong brown fine sandy loam to a depth of about 9 inches, yellowish red loam to a depth of about 24 inches, and yellowish red, mottled gravelly sandy clay loam to a depth of about 30 inches. Hard level-bedded acid sandstone is below a depth of 30 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to very strongly acid throughout. Permeability is moderate. The available water capacity is medium. Runoff is medium, and erosion is a severe hazard. Grasses on this soil respond well to fertilizer.

Included with this soil in mapping are a few small areas of Enders, Mountainburg, and Sidon soils. Also included are a few small areas where the soil has a fine sandy loam surface layer and areas of a soil that is similar to Linker soils except that it is more than 40 inches deep to bedrock.

This soil is moderately suited to cultivated crops. Adapted crops include wheat, corn, and soybeans. Erosion is a severe hazard. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. Conservation practices need to be intensified as the length and grade of the slope increase.

This soil is well suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include common bermudagrass and tall fescue.

This soil is moderately suited to use as woodland. There are no significant limitations. Adapted species include shortleaf pine, loblolly pine, southern red oak, and eastern redcedar.

This soil is moderately suited to most urban uses. Depth to rock is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. Depth to rock is a moderate limitation for dwellings and local roads and streets. Slope and depth to rock are moderate limitations for small commercial buildings. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IIIe-1 and in woodland suitability group 4o7.

36—Linker gravelly fine sandy loam, 8 to 12 percent slopes. This is a moderately deep, well drained, moderately sloping soil on side slopes. Individual areas range from about 10 to 700 acres in size.

Typically, the surface layer is very dark grayish brown gravelly fine sandy loam about 4 inches thick. The subsoil is strong brown fine sandy loam to a depth of about 9 inches, yellowish red loam to a depth of about 24 inches, and yellowish red, mottled gravelly sandy clay loam to a depth of about 30 inches. Hard level-bedded acid sandstone is below a depth of 30 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to very strongly acid throughout. Permeability is moderate. The available water capacity is medium. Runoff is rapid, and erosion is a very severe hazard. Grasses on this soil respond well to fertilizer.

Included with this soil in mapping are a few small areas of Enders, Mountainburg, and Sidon soils and a few small areas where the soil has a fine sandy loam surface layer. In some areas there are boulders and rock outcrops.

This soil is poorly suited to cultivated crops. Erosion is a very severe hazard. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

This soil is well suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include common bermudagrass and tall fescue.

This soil is moderately suited to use as woodland. There are no significant limitations. Adapted species include shortleaf pine, loblolly pine, southern red oak, and eastern redcedar.

This soil is moderately suited to poorly suited to most urban uses. The moderate depth to rock is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. Slope is a severe limitation for small commercial buildings. The moderate depth to rock and slope are moderate limitations for dwellings and local roads and streets. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IVe-1 and in woodland suitability group 4o7.

37—Linker gravelly fine sandy loam, 12 to 30 percent slopes. This is a moderately deep, well drained, moderately steep to steep soil on side slopes. Individual areas range from about 10 to 1,000 acres in size.

Typically, the surface layer is very dark grayish brown gravelly fine sandy loam about 4 inches thick. The subsoil is strong brown fine sandy loam to a depth of about 9 inches, yellowish red loam to a depth of about 24 inches, and yellowish red, mottled gravelly sandy clay loam to a depth of about 30 inches. Hard level-bedded acid sandstone is below a depth of 30 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to very strongly acid throughout. Permeability is moderate. The available water capacity is medium. Runoff is very rapid, and erosion is a very severe hazard.

Included with this soil in mapping are a few small areas of Enders, Mountainburg, and Sidon soils. Also included are a few small areas of a soil that is similar to Linker soils except that it is more than 35 percent, by volume, sandstone fragments throughout. There are stones and boulders on the surface in a few small areas.

This soil is not suited to cultivated crops because of the very severe hazard of erosion and the steep slopes.

This soil is poorly suited to use as pasture. Steep slopes interfere with pasture management. Adapted pasture plants include common bermudagrass and tall fescue.

This soil is moderately suited to use as woodland. There are no significant limitations. Adapted species include shortleaf pine, loblolly pine, southern red oak, and eastern redcedar.

This soil is poorly suited to most urban uses. The moderate depth to rock and the steep slopes are severe limitations for septic tank absorption fields. The steep slopes are also a severe limitation for dwellings, small commercial buildings, and local roads and streets. The limitations generally are difficult or impractical to overcome.

This soil is in capability unit VIe-1 and in woodland suitability group 4o7.

38—Loring silt loam, 1 to 3 percent slopes. This is a deep, moderately well drained, nearly level soil on uplands and terraces adjacent to bottom lands. Individual areas range from about 10 to 100 acres in size.

Typically, the surface layer is brown silt loam about 4 inches thick. The subsoil in the upper part is strong brown silty clay loam about 15 inches thick. In the middle part it is strong brown silt loam about 6 inches thick. The lower part of the subsoil is a brown, mottled silt loam and silty clay loam fragipan that extends to a depth of 72 inches or more.

Natural fertility is moderate, and the content of organic matter is low. This soil is medium acid to very strongly acid throughout. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is medium. A water table is perched within 2 to 3 feet of the surface in winter and early in spring. Crops on this soil respond well to fertilizer, and tilth is easy to maintain.

Included in mapping are a few small areas of Boden, Captina, and Portia soils and a few small areas of soils that are similar to Loring soils except that they have a gray silty layer above the fragipan. Also included are a few small areas where the surface layer and the subsoil are more than 15 percent sand.

This soil is well suited to cultivated crops. The principal crops are soybeans and winter small grains. This soil is also suited to strawberries, potatoes, tomatoes, and other truck crops. Erosion is a moderate hazard. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. Conservation practices need to be intensified as the length and grade of the slope increase.

This soil is well suited to use as pasture, and it is used mainly as pasture. There are no significant limitations. Adapted pasture plants include annual lespedeza, bermudagrass, tall fescue, and white clover.

This soil is well suited to use as woodland. There are no significant limitations. Adapted species include cherrybark oak, sweetgum, southern red oak, loblolly pine, and shortleaf pine.

This soil is moderately suited to poorly suited to most urban uses. Wetness and the moderately slow permeability in the fragipan are severe limitations for septic tank absorption fields. Wetness is a moderate

limitation for dwellings and small commercial buildings. Low strength is a severe limitation for local roads and streets. These limitations generally can be overcome by proper engineering design and drainage.

This soil is in capability unit IIe-1 and in woodland suitability group 3o7.

39—Loring silt loam, 3 to 8 percent slopes. This is a deep, moderately well drained, gently sloping soil on uplands and terraces adjacent to bottom lands. Individual areas range from about 15 to 350 acres in size.

Typically, the surface layer is brown silt loam about 4 inches thick. The subsoil in the upper part is strong brown silty clay loam about 15 inches thick. In the middle part it is strong brown silt loam about 6 inches thick. The lower part of the subsoil is a brown mottled silt loam and silty clay loam fragipan that extends to a depth of 72 inches or more.

Natural fertility is moderate, and the content of organic matter is low. This soil is medium acid to very strongly acid throughout. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is medium. A water table is perched within 2 to 3 feet of the surface in winter and early in spring. Grasses on this soil respond well to fertilizer.

Included in mapping are a few small areas of Boden, Captina, and Portia soils and a few small areas of a soil that is similar to Loring soils except that it has a gray silty layer above the fragipan. Also included are a few small areas where the subsoil is yellowish red and areas where the sand content in the surface layer and the subsoil is more than 15 percent.

This soil is moderately suited to cultivated crops, including soybeans, grain sorghum, and winter small grains. It is also suited to truck crops, such as strawberries, potatoes, and tomatoes, and to fruit crops, such as peaches and apples. Erosion is a severe hazard. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. Conservation practices need to be intensified as the length and grade of the slope increase.

This soil is well suited to use as pasture, and it is used mainly as pasture. There are no significant limitations. Adapted pasture plants include annual lespedeza, tall fescue, bermudagrass, and white clover.

This soil is well suited to use as woodland. There are no significant limitations. Adapted species include loblolly pine, shortleaf pine, sweetgum, cherrybark oak, and southern red oak.

This soil is moderately suited to poorly suited to most urban uses. Wetness and the moderately slow permeability in the fragipan are severe limitations for septic tank absorption fields. Wetness is a moderate limitation for dwellings. Wetness and slope are moderate limitations for small commercial buildings. Low strength is a severe limitation for local roads and streets. These limitations generally can be overcome by proper engineering design and drainage.

This soil is in capability unit IIIe-2 and in woodland suitability group 3o7.

40—Loring silt loam, 8 to 12 percent slopes. This is a deep, moderately well drained, moderately sloping soil on uplands and terraces adjacent to bottom lands. Individual areas range from about 40 to 900 acres in size.

Typically, the surface layer is brown silt loam about 4 inches thick. The subsoil in the upper part is strong brown silty clay loam about 15 inches thick. In the middle part it is strong brown silt loam about 6 inches thick. The lower part of the subsoil is a brown, mottled silt loam and silty clay loam fragipan that extends to a depth of 72 inches or more.

Natural fertility is moderate, and the content of organic matter is low. This soil is medium acid to very strongly acid throughout. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is medium. A water table is perched within 2 to 3 feet of the surface in winter and early in spring. Grasses on this soil respond well to fertilizer.

Included in mapping are a few small areas of Boden, Captina, and Portia soils and a few small areas of a soil that is similar to Loring soils except that it has a gray silty layer above the fragipan. Also included are a few small areas where the subsoil is yellowish red, areas where the surface layer and the subsoil are more than 15 percent sand, a few eroded areas, and a few small areas where slopes are more than 12 percent.

This soil is poorly suited to cultivated crops. Erosion is a very severe hazard in unprotected areas.

This soil is well suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include annual lespedeza, bermudagrass, tall fescue, and clover. In some areas, deep gullies on the steeper slopes are a moderate limitation to the use of farm equipment.

This soil is well suited to use as woodland. There are no significant limitations. Adapted species include loblolly pine, shortleaf pine, sweetgum, cherrybark oak, and southern red oak.

This soil is moderately suited to poorly suited to most urban uses. The moderately slow permeability in the fragipan and wetness are severe limitations for septic tank absorption fields. Slope and wetness are moderate limitations for dwellings. Slope is a severe limitation for small commercial buildings. Low strength is a severe limitation for local roads and streets. These limitations generally can be overcome by proper engineering design, if economically practical.

This soil is in capability unit IVe-2 and in woodland suitability group 3o7.

41—Moko-Rock outcrop complex, 3 to 20 percent slopes. This complex consists of Moko soils and Rock outcrop on benches and ridgetops. Areas of each are so intermingled that it was not practical to map them separately at the scale used for mapping. The individual areas range from about 1 to 4 acres in size. The mapped areas of the complex range from about 10 to 60 acres in size.

Moko soils make up about 60 percent of each mapped area, Rock outcrop makes up 25 percent, and included soils make up 15 percent.

Typically, the surface layer of the Moko soils is very dark gray very stony silt loam about 3 inches thick. The layer below that is very dark grayish brown very stony silty clay loam about 7 inches thick. Gray, hard, fractured limestone extends to a depth of 12 inches or more.

Natural fertility of the Moko soils is moderate, and the content of organic matter is moderate. The soils are mildly alkaline or neutral throughout. Permeability is moderate. The available water capacity is very low.

Rock outcrop consists of hard level-bedded limestone bedrock.

Included with this complex in mapping are small areas of Arkana and Newnata soils and soils that are similar to Moko soils except that they have a clayey subsoil and fewer coarse fragments.

The soils making up this complex are not suited to cultivated crops. Stones, rock outcrops, and droughtiness are the main limitations. The soils are used mainly as wildlife habitat and for low-grade hardwoods and cedar. The soils should not be cleared because erosion is a very severe hazard if the native vegetation is removed.

The soils are not suited to use as pasture, and they are poorly suited to use as woodland. The main adapted species is eastern redcedar. The use of equipment is severely limited, erosion is a moderate hazard, and seedling mortality is moderate.

There are severe limitations for urban use. Shallowness to rock and large stones are severe limitations for dwellings, small commercial buildings, local roads and streets, and septic tank filter fields. Slope is a severe limitation for small commercial buildings. The limitations are difficult or impractical to overcome.

Moko soils are in capability unit VIIs-2 and in woodland suitability group 5x3. Rock outcrop is not assigned to a capability unit or a woodland group.

42—Mountainburg stony fine sandy loam, 3 to 12 percent slopes. This is a shallow, well drained, gently sloping to moderately sloping soil on plateaus, ridgetops, and side slopes. Individual areas range from about 10 to 300 acres in size.

Typically, the surface layer is dark brown stony fine sandy loam about 5 inches thick. The subsoil is strong brown very gravelly sandy clay loam and very gravelly sandy loam. It extends to a depth of about 18 inches. Below that, there is hard, level-bedded acid sandstone.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid to very strongly acid throughout. Permeability is moderately rapid. The available water capacity is very low. Grasses on this soil respond poorly to fertilizer.

Included with this soil in mapping are a few small areas of Enders, Linker, and Sidon soils. Also included are a few small areas where there are rock outcrops and a few small areas where there are boulders on the surface.

This soil is not suited to cultivated crops, and it is poorly suited to use as pasture. The main limitations are droughtiness, which is caused by the shallowness of the soil, and stones on the surface, which make seedbed preparation difficult. Adapted pasture plants include bermudagrass, sericea lespedeza, and tall fescue.

This soil is poorly suited to use as woodland. Seedling mortality is moderate because of the very low available water capacity, and the use of equipment is severely limited because of large stones on the surface. Adapted species include shortleaf pine, eastern redcedar, and loblolly pine.

This soil is poorly suited to most urban uses. Shallowness to rock and stones are severe limitations for septic tank filter fields, dwellings, small commercial buildings, and local roads and streets. These limitations are difficult or impractical to overcome.

This soil is in capability unit VIs-2 and in woodland suitability group 5x3.

43—Newnata silty clay loam, 3 to 8 percent slopes. This is a deep, well drained, gently sloping soil on side slopes. Individual areas range from about 15 to 375 acres in size.

Typically, the surface layer is dark brown silty clay loam about 4 inches thick. The subsoil is strong brown, mottled silty clay to a depth of about 35 inches and yellowish brown, mottled silty clay to a depth of about 48 inches. The underlying material is soft, black and gray weathered shale; it extends to a depth of about 52 inches. Below that, there is hard calcareous shale bedrock.

Natural fertility is moderate, and the content of organic matter is low. The surface layer is medium acid to neutral, and the subsoil is medium acid to mildly alkaline. Permeability is slow. The available water capacity is medium. Runoff is medium, and erosion is a severe hazard if cultivated crops are grown. Crops on this soil respond well to fertilizer. However, tilth is difficult to maintain.

Included with this soil in mapping are a few small areas of Arkana, Egam, and Moko soils. Also included are a few small areas of soils that are similar to Newnata soils except that they are deeper than 60 inches to bedrock.

This soil is moderately suited to cultivated crops. The severe hazard of erosion is the main limitation. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

This soil is moderately suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include fescue, clover, and bermudagrass.

This soil is moderately suited to use as woodland. There are no significant problems in woodland management. Adapted species include eastern redcedar, loblolly pine, red oak, black locust, and black walnut.

This soil is poorly suited to urban uses. The slow permeability is a severe limitation for septic tank filter fields. The high shrink-swell potential is a severe limitation for dwellings and small commercial buildings. Low strength and the high shrink-swell potential are severe limitations for local roads and streets. The limitations are expensive and difficult to overcome.

This soil is in capability unit IIIe-4 and in woodland suitability group 4o7.

44—Newnata silty clay loam, 8 to 12 percent slopes. This is a deep, well drained, moderately sloping soil on side slopes. Individual areas range from 50 to 400 acres or more in size.

Typically, the surface layer is dark brown silty clay loam about 4 inches thick. The subsoil is strong brown, mottled silty clay to a depth of about 35 inches and yellowish brown, mottled silty clay to a depth of about 48 inches. The underlying material is soft, black and gray weathered shale; it extends to a depth of about 52 inches. Below that, there is hard calcareous shale bedrock.

Natural fertility is moderate, and the content of organic matter is low. The surface layer is medium acid to neutral, and the subsoil is medium acid to mildly alkaline. Permeability is slow. The available water capacity is medium. Runoff is rapid, and erosion is a very severe hazard if cultivated crops are grown. Crops on this soil respond well to fertilizer. However, tilth is difficult to maintain.

Included with this soil in mapping are a few small areas of Arkana and Moko soils. Also included are a few small areas of soils that are similar to Newnata soils except that they are deeper than 60 inches to bedrock.

This soil is poorly suited to cultivated crops. The very severe hazard of erosion is the main limitation.

This soil is moderately suited to use as pasture. It is used mainly as pasture. The adapted pasture plants include fescue, clover, and bermudagrass.

This soil is moderately suited to use as woodland. There are no significant problems in woodland management. Adapted species include eastern redcedar, loblolly pine, red oak, black locust, and black walnut.

This soil is poorly suited to most urban uses. The slow permeability is a severe limitation for septic tank absorption fields. The high shrink-swell potential is a severe limitation for dwellings. Slope and the high shrink-swell potential are severe limitations for small commercial buildings. Low strength and the high shrink-swell potential are severe limitations for local roads and streets. The limitations are difficult to overcome.

This soil is in capability unit IVe-4 and in woodland suitability group 4o7.

45—Noark very cherty silt loam, 3 to 8 percent slopes. This is a deep, well drained, gently sloping soil on ridgetops and side slopes in the Ozark Highlands. Individual areas range from about 10 to 175 acres in size.

Typically, the surface layer is dark brown very cherty silt loam about 4 inches thick. The subsurface layer is brown very cherty silt loam that extends to a depth of about 14 inches. The subsoil is strong brown very cherty silty clay loam to a depth of about 24 inches; yellowish red very cherty silty clay to a depth of about 34 inches; and dark red very cherty clay to a depth of 72 inches or more.

Natural fertility is low, and the content of organic matter is low. The surface layer and subsurface layer are slightly acid to very strongly acid, and the subsoil is strongly acid to extremely acid. Permeability is moderate. The available water capacity is low. Runoff is medium, and erosion is a severe hazard. Grasses respond well to fertilizer.

Included with this soil in mapping are a few small areas of Arkana, Clarksville, and Gepp soils. Also included are a few small areas of soils that are similar to Noark soils except that they are less than 60 inches deep to bedrock.

This soil is poorly suited to cultivated crops. The main limitations are chert fragments on the surface that interfere with tillage, droughtiness, and a severe hazard of erosion.

This soil is moderately suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include bermudagrass and tall fescue. Chert fragments on the surface can interfere with pasture management.

This soil is moderately suited to use as woodland. Adapted species include red oak, white oak, eastern redcedar, and shortleaf pine. The use of equipment is moderately limited, and seedling mortality is moderate.

This soil is well suited to moderately suited to most urban uses. The moderate permeability is a moderate limitation for septic tank filter fields. Slope is a moderate limitation for small commercial buildings. There are no significant limitations for dwellings and local roads and streets. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IIIe-3 and in woodland suitability group 4f8.

46—Noark very cherty silt loam, 8 to 12 percent slopes. This is a deep, well drained, moderately sloping

soil on side slopes in the Ozark Highlands. Individual areas range from about 20 to 200 acres in size.

Typically, the surface layer is dark brown very cherty silt loam about 4 inches thick. The subsurface layer is brown very cherty silt loam that extends to a depth of about 14 inches. The subsoil is strong brown very cherty silty clay loam to a depth of about 24 inches; yellowish red very cherty silty clay to a depth of about 34 inches; and dark red very cherty clay to a depth of 72 inches or more.

Natural fertility is low, and the content of organic matter is low. The surface and subsurface layers are slightly acid to very strongly acid, and the subsoil is strongly acid to extremely acid. Permeability is moderate. The available water capacity is low. Runoff is rapid, and erosion is a very severe hazard. Grasses respond well to fertilizer.

Included with this soil in mapping are a few small areas of Arkana, Clarksville, and Gepp soils. Also included are a few small areas of a soil that is similar to this Noark soil except that it is less than 60 inches deep to bedrock.

This soil is poorly suited to cultivated crops. The main limitations are a very cherty surface layer that interferes with tillage, droughtiness, and a very severe hazard of erosion.

This soil is moderately suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include bermudagrass and tall fescue. Slope and chert fragments on the surface can interfere with pasture management.

This soil is moderately suited to use as woodland. Adapted species include red oak, white oak, eastern redcedar, and shortleaf pine. Seedling mortality is moderate, and the use of equipment is moderately limited.

This soil is moderately suited to most urban uses. The moderate permeability and slope are moderate limitations for septic tank filter fields. Slope is a moderate limitation for dwellings and local roads and streets. Slope is a severe limitation for small commercial buildings. These limitations generally can be overcome by proper engineering design.

This soil is in capability group IVe-3 and in woodland suitability group 4f8.

47—Noark very cherty silt loam, 12 to 30 percent slopes. This is a deep, well drained, moderately steep to steep soil on side slopes in the Ozark Highlands. Individual areas range from about 20 to 400 acres in size.

Typically, the surface layer is dark brown very cherty silt loam about 4 inches thick. The subsurface layer is brown very cherty silt loam that extends to a depth of about 14 inches. The subsoil is strong brown very cherty silty clay loam to a depth of about 24 inches; yellowish red very cherty silty clay to a depth of about 34 inches; and dark red very cherty clay to a depth of about 72 inches or more.

Natural fertility is low, and the content of organic matter is low. The surface and subsurface layers are slightly acid to very strongly acid, and the subsoil is strongly acid to extremely acid. Permeability is moderate. The available water capacity is low. Runoff is rapid, and erosion is a very severe hazard.

Included with this soil in mapping are a few small areas of Arkana, Clarksville, and Gepp soils. Also included are a few small areas of a soil that is similar to this Noark soil except that it is less than 60 inches deep to bedrock.

This soil is not suited to cultivated crops and poorly suited to use as pasture. Slope, chert fragments on the surface, droughtiness, and a very severe hazard of erosion are the main limitations. Adapted pasture plants include bermudagrass and tall fescue.

This soil is moderately suited to use as woodland. Adapted species include red oak, white oak, eastern redcedar, and shortleaf pine. The use of equipment is severely limited. Seedling mortality is moderate, and erosion is a moderate hazard.

This soil is poorly suited to most urban uses. Slope is a severe limitation for septic tank filter fields, dwellings, small commercial buildings, and local roads and streets. This limitation generally is difficult to overcome.

This soil is in capability unit VIe-2 and in woodland suitability group 4r9.

48—Peridge silt loam, 3 to 8 percent slopes. This is a deep, well drained, gently sloping soil on uplands and stream terraces in the Ozark Highlands. Individual areas range from about 10 to 150 acres in size.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil is strong brown silt loam to a depth of about 13 inches; yellowish red silty clay loam to a depth of about 20 inches; red, mottled silty clay loam to a depth of about 40 inches; variegated red and yellowish red gravelly silty clay loam to a depth of about 55 inches; and red, mottled silty clay loam to a depth of 72 inches or more.

Natural fertility is moderate, and the content of organic matter is low. This soil is medium acid to very strongly acid throughout. Permeability is moderate. The available water capacity is high. Runoff is medium, and erosion is a severe hazard. Crops on this soil respond well to fertilizer. Tilth is easy to maintain except where erosion has removed the surface layer.

Included with this soil in mapping are a few small areas of Captina, Gepp, and Secesh soils and a few small areas of a soil that is similar to this Peridge soil except that it is underlain by limestone bedrock at a depth of about 45 inches. Also included are a few small areas where slopes are as much as 12 percent and a few areas where erosion has removed the original surface layer.

This soil is moderately suited to cultivated crops. Adapted crops include grain sorghum, small grains, soybeans, and truck crops. This soil is also suited to orchard crops, including peaches, apples, and pears. Erosion is a severe hazard. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

This soil is well suited to use as pasture, and it is used mainly as pasture (fig. 7). There are no significant limitations. Adapted pasture plants include bermudagrass, tall fescue, bahiagrass, lespedeza, and clover.

This soil is well suited to use as woodland. Adapted species include shortleaf pine, red oak, hickory, and eastern redcedar. There are no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. The moderate permeability is a moderate limitation for septic tank absorption fields. There are no limitations for dwellings. Slope is a moderate limitation for small commercial buildings. Low strength is a severe limitation for local roads and streets. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IIIe-1 and in woodland suitability group 3o7.

49—Pits-Dumps complex, 20 to 40 percent slopes. This complex consists of irregularly shaped pits and dumps in areas that have been surface mined. Individual areas are 10 to 160 acres in size.

Pits make up about 50 percent of this complex, Dumps make up 40 percent, and included soils make up the rest.

Pits generally are 10 to 150 feet deep and have vertical or nearly vertical walls. The floor and walls of a pit are mainly rock and support very little vegetation.

Dumps are uneven piles of material consisting mainly of sandstone and limestone rock. They are 10 to 100 feet high and support very little vegetation without major reclamation.

Included with Pits and Dumps in mapping are areas of Clarksville and Gepp soils.

This complex is not suited to agricultural or urban uses without major reclamation.

This complex is not assigned to a capability unit or woodland suitability group.

Figure 7.—Fescue pasture on Peridge silt loam, 3 to 8 percent slopes. This soil is well suited to use as pasture.

50—Portia fine sandy loam, 3 to 8 percent slopes. This is a deep, well drained, gently sloping soil on uplands in the Ozark Highlands. Individual areas range from about 10 to 150 acres in size.

Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam that extends to a depth of about 12 inches. The subsoil is yellowish red sandy clay loam to a depth of about 26 inches; yellowish red, mottled sandy clay loam to a depth of about 42 inches; and red, mottled sandy clay loam to a depth of about 72 inches.

Natural fertility is low, and the content of organic matter is low. This soil is medium acid to strongly acid throughout. Permeability is moderately slow. The available water capacity is medium. Runoff is medium, and erosion is a severe hazard. Grasses respond well to fertilizer.

Included with this soil in mapping are a few small areas of Boden, Captina, Lily, and Loring soils. Also included are a few small areas of a soil that is similar to this Portia soil except that it has gray mottles in the upper 24 inches of the subsoil.

This soil is moderately suited to cultivated crops. Adapted crops include grain sorghum, small grains, soybeans, and truck crops. Erosion is a severe limitation. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

This soil is well suited to use as pasture, and it is used mainly as pasture. There are no significant limitations. Adapted pasture plants include bermudagrass and fescue.

This soil is well suited to use as woodland. There are no significant limitations. Adapted species include sweetgum and loblolly pine.

This soil is moderately suited to most urban uses. The moderately slow permeability is a severe limitation for septic tank filter fields. There are no limitations for dwellings or local roads and streets. Slope is a moderate limitation for small commercial buildings. The limitations generally can be overcome by proper engineering design.

This soil is in capability unit IIIe-1 and in woodland suitability group 3o7.

51—Portia fine sandy loam, 8 to 12 percent slopes. This is a deep, well drained, moderately sloping soil on uplands in the Ozark Highlands. Individual areas range from about 10 to 175 acres in size.

Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam that extends to a depth of 12 inches. The subsoil is yellowish red sandy clay loam to a depth of about 26 inches; yellowish red, mottled sandy clay loam to a depth of about 42 inches; and red, mottled sandy clay loam to a depth of about 72 inches.

Natural fertility is low, and the content of organic matter is low. This soil is medium acid to strongly acid throughout. Permeability is moderately slow. The available water capacity is medium. Runoff is rapid, and erosion is a very severe hazard. Grasses respond well to fertilizer.

Included with this soil in mapping are a few small areas of Boden, Captina, Clarksville, Lily, and Loring soils. Also included are a few small areas of a soil that is similar to this Portia soil except that it has gray mottles in the upper 24 inches of the subsoil. Also included are a few small areas where the soil is underlain by stratified shale and sandstone.

This soil is poorly suited to crops because of the very severe hazard of erosion.

This soil is well suited to use as pasture, and it is used mainly as pasture. There are no significant limitations. Adapted pasture plants include bermudagrass and tall fescue.

This soil is well suited to use as woodland. There are no significant limitations. Adapted species include sweetgum and loblolly pine.

This soil is moderately suited to most urban uses. The moderately slow permeability is a severe limitation for septic tank filter fields. Slope is a moderate limitation for dwellings. Slope is a severe limitation for small commercial buildings. Slope is a moderate limitation for local roads and streets. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IVe-1 and in woodland suitability group 3o7.

52—Saffell gravelly fine sandy loam, 8 to 12 percent slopes. This is a deep, well drained, moderately sloping soil on side slopes and ridgetops. Individual areas range from about 20 to 700 acres in size.

Typically, the surface layer is dark brown gravelly fine sandy loam about 3 inches thick (fig. 8). The subsurface layer is yellowish brown gravelly fine sandy loam that extends to a depth of about 8 inches. The subsoil is strong brown very gravelly fine sandy loam to a depth of about 14 inches and yellowish red very gravelly sandy clay loam to a depth of about 52 inches. The underlying material is yellowish red, gravelly sandy loam that extends to a depth of about 72 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid or very strongly acid throughout. Permeability is moderate. The available water capacity is low. Runoff is rapid, and erosion is a very severe hazard. Grasses respond well to fertilizer.

Included with this soil in mapping are a few small areas of Boden, Clarksville, Loring, and Portia soils. Also included are a few small areas where the soil has a very gravelly surface and a few small areas where slopes are less than 8 percent.

This soil is poorly suited to cultivated crops. It is droughty, and erosion is a very severe hazard.

This soil is moderately suited to use as pasture. Adapted pasture plants are bahiagrass, fescue, common

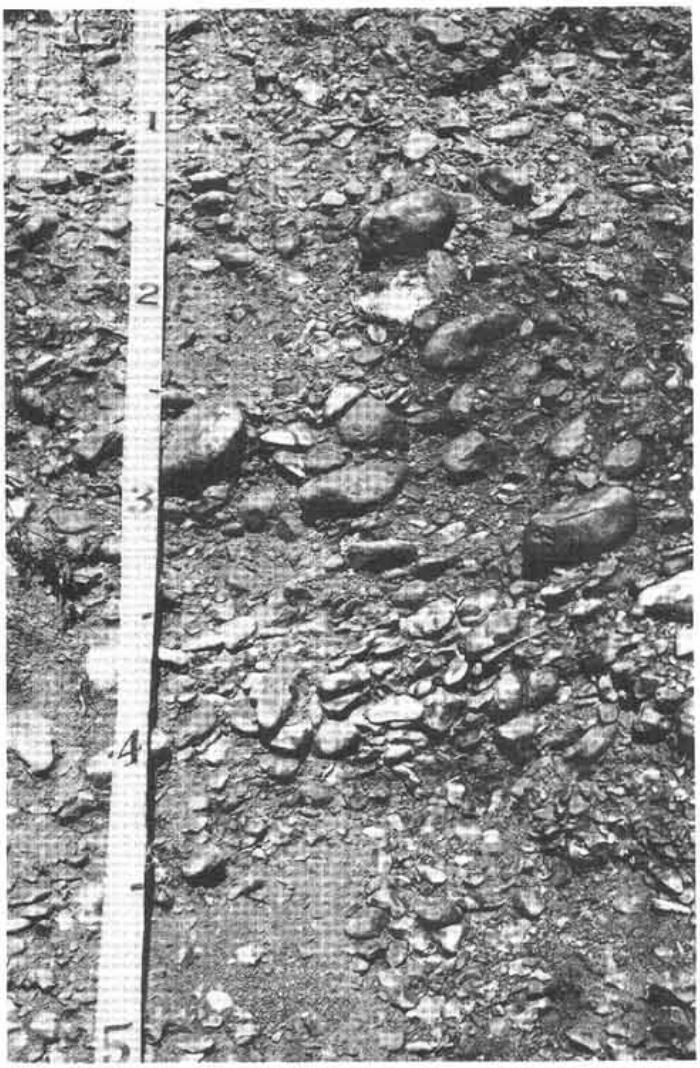


Figure 8.—Profile of Saffell gravelly fine sandy loam, 8 to 12 percent slopes. The scale is in inches.

bermudagrass, and improved bermudagrass. Droughtiness is a moderate hazard during the drier seasons.

This soil is moderately suited to use as woodland. Adapted species include loblolly pine, shortleaf pine, and eastern redcedar. Seedling mortality is a moderate hazard.

This soil is moderately suited to most urban uses. The moderate permeability is a moderate limitation for septic tank filter fields. Slope is a moderate limitation for septic tank absorption fields, dwellings, and local roads and streets. Slope is a severe limitation for small commercial buildings. These limitations generally can be overcome by proper engineering design.

This soil is in capability group IVe-3 and in woodland suitability group 4f2.

53—Saffell gravelly fine sandy loam, 12 to 20 percent slopes. This is a deep, well drained, moderately steep soil on side slopes and ridgetops. Individual areas range from about 50 to 800 acres in size.

Typically, the surface layer is dark brown gravelly fine sandy loam about 3 inches thick. The subsurface layer is yellowish brown gravelly fine sandy loam that extends to a depth of about 8 inches. The subsoil is strong brown very gravelly fine sandy loam to a depth of about 14 inches and yellowish red very gravelly sandy clay loam to a depth of about 52 inches. The underlying material is yellowish red gravelly sandy loam that extends to a depth of about 72 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid or very strongly acid throughout. Permeability is moderate. The available water capacity is low. Runoff is rapid, and erosion is a very severe hazard. Grasses respond well to fertilizer.

Included with this soil in mapping are a few small areas of Boden, Clarksville, and Portia soils. Also included are a few small areas of a soil that is gravelly in the upper part and is underlain by shale and siltstone. Also included are a few small areas where slopes are less than 12 percent.

This soil is not suited to cultivated crops because of steep slopes and the very severe hazard of erosion.

This soil is poorly suited to use as pasture mainly because of droughtiness and steep slopes. Adapted pasture plants are bahiagrass, fescue, common bermudagrass, and improved bermudagrass.

This soil is moderately suited to use as woodland. Adapted species include loblolly pine, shortleaf pine, and eastern redcedar. Seedling mortality is a moderate hazard.

This soil is poorly suited to most urban uses. Slope is a severe limitation for septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets. This limitation is difficult or impractical to overcome.

This soil is in capability unit VIe-2 and in woodland suitability group 4f2.

54—Secesh silt loam, frequently flooded. This is a deep, well drained, nearly level soil on stream terraces in the Ozark Highlands. Individual areas range from about 10 to 200 acres in size. Slopes are 1 to 3 percent.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil is yellowish brown silt loam to a depth of about 20 inches; strong brown silt loam to a depth of about 25 inches; strong brown cherty silt loam to a depth of about 36 inches; equally mottled pale brown and dark yellowish brown very cherty silt loam to a depth of about 52 inches; and mottled yellowish brown, pale brown, and light brownish gray

very cherty silt loam to a depth of about 62 inches. The underlying material is mottled brown and light brownish gray very cherty silt loam to a depth of about 69 inches and mottled dark yellowish brown and pale brown very cherty silt loam to a depth of about 72 inches.

Natural fertility is moderate, and the content of organic matter is low. The surface layer and upper part of the subsoil are slightly acid or medium acid, and the lower part of the subsoil is medium acid or strongly acid. Permeability is moderate. The available water capacity is low. This soil is flooded frequently for brief periods late in winter and early in spring. Scouring is a severe hazard if the soil is cultivated. Crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Captina, Peridge, Sturkie, and Wideman soils. Also included are a few small areas where the soil has a very cherty surface.

This soil is poorly suited to cultivated crops mainly because of the hazard of flooding and the hazard of erosion caused by scouring.

This soil is well suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants are bermudagrass, tall fescue, lespedeza, and clover. The main limitation is the hazard of flooding. This limitation can be minimized if the soil is grazed during the drier seasons.

This soil is moderately suited to use as woodland. Adapted species include white oak, American sycamore, black walnut, and cottonwood. Flooding is of brief duration but can delay logging operations for several days.

This soil is severely limited for most urban uses. Flooding is a severe limitation for dwellings, small commercial buildings, local roads and streets, and septic tank absorption fields. Major flood control practices are needed to overcome this limitation.

This soil is in capability unit IVw-1 and in woodland suitability group 4o7.

55—Sidon silt loam, 1 to 3 percent slopes. This is a deep, moderately well drained, nearly level soil on plateaus, ridgetops, and side slopes in the Boston Mountains. Individual areas range from about 10 to 60 acres in size.

Typically, the surface layer is yellowish brown silt loam about 4 inches thick. The subsoil is strong brown loam to a depth of about 14 inches and yellowish brown clay loam to a depth of about 24 inches. The part below that, to a depth of 38 inches, is a yellowish brown, mottled clay loam fragipan. The bottom part of the subsoil, to a depth of about 45 inches, is yellowish brown, mottled clay loam. Hard level-bedded sandstone bedrock is below a depth of 45 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid or very strongly acid throughout. Permeability is slow. The available water capacity is medium. This soil has a water table perched within 2 feet of the surface late in winter and early in spring. Runoff is medium, and erosion is a moderate hazard. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Linker and Mountainburg soils. Also included are a few small areas where the soil has a fine sandy loam surface layer.

This soil is well suited to cultivated crops. The main crop is soybeans. Other adapted crops are winter small grains and truck crops. Erosion is a moderate hazard. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

This soil is well suited to use as pasture, and it is used mainly as pasture. There are no significant limitations. Adapted pasture plants are bermudagrass and tall fescue.

This soil is well suited to use as woodland. There are no significant limitations. Adapted species include shortleaf pine, loblolly pine, white oak, and northern red oak.

This soil is moderately suited to most urban uses. The slow permeability and wetness are severe limitations for septic tank absorption fields. Wetness is a moderate limitation for dwellings without basements and small commercial buildings. Low strength and wetness are moderate limitations for local roads and streets. The limitations generally can be overcome by proper engineering design and drainage.

This soil is in capability unit IIe-1 and in woodland suitability group 3o7.

56—Sidon silt loam, 3 to 8 percent slopes. This is a deep, moderately well drained, gently sloping soil on plateaus, side slopes, and ridgetops in the Boston Mountains. Individual areas range from about 25 to 500 acres in size.

Typically, the surface layer is yellowish brown silt loam about 4 inches thick. The subsoil is strong brown loam to a depth of about 14 inches and yellowish brown clay loam to a depth of about 24 inches. The part below that, to a depth of 38 inches, is a yellowish brown, mottled clay loam fragipan. The bottom part of the subsoil, which extends to a depth of about 45 inches, is yellowish brown, mottled clay loam. Hard level-bedded sandstone bedrock is below a depth of 45 inches.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid or very strongly acid throughout. Permeability is slow. The available water capacity is medium. This soil has a water table perched within 2 feet of the surface late in winter and early in spring. Runoff is medium, and erosion is a severe hazard. Crops respond well to fertilizer.

Included with this soil in mapping are a few small areas of Enders, Linker, and Mountainburg soils and a few small areas where the soil has a fine sandy loam surface layer.

This soil is moderately suited to cultivated crops in the less sloping areas. The main crop is soybeans. Other suitable crops include winter small grains and truck crops. Erosion is a severe limitation in the more sloping areas. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

This soil is well suited to use as pasture, and it is used mainly as pasture. There are no significant limitations. The adapted pasture plants include bermudagrass and tall fescue.

This soil is well suited to use as woodland. There are no significant limitations. The adapted species include shortleaf pine, loblolly pine, white oak, and northern red oak.

This soil is moderately suited to most urban uses. The slow permeability and wetness are severe limitations for septic tank absorption fields. Wetness is a moderate limitation for dwellings. Wetness and slope are moderate limitations for small commercial buildings. Low strength and wetness are moderate limitations for local roads and streets. The limitations generally can be overcome by proper engineering design and by drainage.

This soil is in capability unit IIIe-2 and in woodland suitability group 3o7.

57—Sidon silt loam, 8 to 12 percent slopes. This is a deep, moderately well drained, moderately sloping soil on plateaus, side slopes, and ridgetops in the Boston Mountains. Individual areas range from about 20 to 200 acres in size.

Typically, the surface layer is yellowish brown silt loam about 4 inches thick. The subsoil is strong brown loam to a depth of about 14 inches and yellowish brown clay loam to a depth of about 24 inches. The part below that, to a depth of 38 inches, is a yellowish brown, mottled clay loam fragipan. The bottom part of the subsoil, which extends to a depth of about 45 inches, is yellowish brown, mottled clay loam. Hard level-bedded sandstone bedrock is below a depth of 45 inches.

Natural fertility is low, and the content of organic matter is low. The soil is strongly acid or very strongly acid throughout. Permeability is slow. The available water capacity is medium. This soil has a water table perched within 2 feet of the surface late in winter and early in spring. Runoff is rapid, and erosion is a very severe hazard. Grasses respond well to fertilizer.

Included with this soil in mapping are a few small areas of Enders, Linker, and Mountainburg soils and a few small areas where the soil has a fine sandy loam surface layer. Also included are a few small areas of rock outcrops.

This soil is poorly suited to crops because of the very severe hazard of erosion.

This soil is well suited to use as pasture, and it is used mainly as pasture. There are no significant limitations. The adapted pasture plants include bermudagrass and tall fescue.

This soil is well suited to use as woodland. There are no significant limitations. The adapted species include shortleaf pine, loblolly pine, white oak, and northern red oak.

This soil is moderately suited to poorly suited to most urban uses. The slow permeability and wetness are severe limitations for septic tank absorption fields. Wetness and slope are moderate limitations for dwellings. Slope is a severe limitation for small commercial buildings. Slope, wetness, and low strength are moderate limitations for local roads and streets. These limitations generally can be overcome by proper engineering design and by drainage.

This soil is in capability group IVe-2 and in woodland suitability group 3o7.

58—Spadra fine sandy loam, 0 to 1 percent slopes. This is a deep, well drained, level soil on stream terraces. Individual areas range from about 20 to 600 acres in size.

Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsoil is reddish brown loam to a depth of about 22 inches, dark brown loam to a depth of about 40 inches, and reddish brown fine sandy loam to a depth of about 60 inches. The underlying material to a depth of about 72 inches is reddish brown fine sandy loam.

Natural fertility is moderate, and the content of organic matter is low. This soil is medium acid to very strongly acid throughout. Permeability is moderate. The available water capacity is medium. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Portia, Secesh, and Wideman soils and a few areas adjacent to streams where the soil is frequently flooded. Also included are a few small areas where the subsoil is red sandy clay and a few small areas where it is yellowish red and mottled.

This soil is well suited to cultivated crops. There are no significant limitations. The main crop is soybeans. Other adapted crops are corn and winter small grains. This soil is also well suited to truck crops.

This soil is well suited to use as pasture. There are no significant limitations. Adapted pasture plants include common bermudagrass and tall fescue.

This soil is well suited to use as woodland. There are no significant limitations. Adapted species include loblolly pine, shortleaf pine, red oak, and eastern redcedar.

This soil is well suited to most urban uses. The moderate permeability is a moderate limitation for septic tank filter fields. There are no significant limitations for dwellings, small commercial buildings, and local roads and streets.

This soil is in capability unit I-1 and in woodland suitability group 2o7.

59—Sturkie silt loam, frequently flooded. This is a deep, well drained, level to nearly level soil on flood plains. Slopes are 0 to 3 percent. Individual areas range from 20 to 175 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 26 inches thick. The subsoil is dark brown silt loam and silty clay loam. It extends to a depth of 72 inches or more.

Natural fertility is high, and the content of organic matter is moderate. The surface layer is mildly alkaline to medium acid, and the subsoil is moderately alkaline to slightly acid. Permeability is moderate. The available water capacity is high. Flooding occurs for brief periods more often than once every 2 years late in winter and early in spring. Crops respond well to fertilizer, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Wideman soils and a few small areas where the soil has a sandy surface layer. Also included are areas on high ridges where the soil is not subject to flooding.

This soil is moderately suited to crops that have a short growing season. It is used mainly as cropland. The main limitation is the hazard of flooding in winter and early in spring. Adapted crops are soybeans and grain sorghum.

This soil is moderately suited to use as pasture. In some small areas it is used as pasture. Adapted pasture plants include common bermudagrass, tall fescue, improved bermudagrass, and lespedeza. Flooding is a severe limitation. This limitation can be overcome by restricting grazing to the drier seasons.

This soil is well suited to use as woodland. There are no significant limitations. Adapted species include northern red oak, white oak, American sycamore, and eastern cottonwood.

This soil is severely limited for most urban uses. Flooding is a severe limitation for septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets. This limitation is difficult or impractical to overcome.

This soil is in capability unit IVw-1 and in woodland suitability group 2o4.

60—Taft silt loam, 0 to 2 percent slopes. This is a deep, somewhat poorly drained, level to nearly level soil on terraces and in depressions. Individual areas range from about 10 to 60 acres in size.

Typically, the surface layer is yellowish brown, mottled silt loam about 7 inches thick. The subsurface layer is brown, mottled silt loam that extends to a depth of about 14 inches. The subsoil is pale brown, mottled silt loam to a depth of about 22 inches. Below that, to a depth of about 46 inches, it is a firm and brittle fragipan of mottled silty clay loam. The bottom part of the subsoil, which extends to a depth of about 72 inches, is coarsely mottled gray, brown, and yellow silty clay loam.

Natural fertility is low, and the content of organic matter is low. This soil is strongly acid or very strongly acid throughout. Permeability is slow. The available water capacity is medium. This soil has a water table perched within 1 to 2 feet of the surface late in winter and early in spring.

Included with this soil in mapping are a few small areas of Captina and Secesh soils. Also included are a few small mounded areas of a soil that is similar to this Taft soil except that it is browner and does not have a fragipan.

This soil is moderately suited to cultivated crops. The main limitation is wetness.

This soil is moderately suited to use as pasture. Adapted pasture plants include common bermudagrass, fescue, and clover. Wetness late in winter and early in spring is a moderate limitation.

This soil is well suited to use as woodland. Adapted species include upland oak, loblolly pine, shortleaf pine, and sweetgum. Wetness late in winter and early in spring somewhat restricts the use of equipment. Seedling mortality is moderate because of the wetness.

This soil is poorly suited to most urban uses. The slow permeability and wetness are severe limitations for septic tank filter fields. Wetness is a severe limitation for dwellings and small commercial buildings. Low strength is a severe limitation for local roads and streets. These limitations generally are difficult to overcome.

This soil is in capability unit IIIw-3 and in woodland suitability group 3w8.

61—Wallen gravelly silt loam, 3 to 8 percent slopes. This is a moderately deep, somewhat excessively drained, gently sloping soil on side slopes and ridgetops in the Ozark Highlands. Individual areas range from about 15 to 350 acres in size.

Typically, the surface layer is dark brown gravelly silt loam about 3 inches thick. The subsurface layer is yellowish brown gravelly silt loam that extends to a depth of about 8 inches. The subsoil is yellowish brown very cobbly silt loam to a depth of about 18 inches and yellowish brown, mottled very cobbly silt loam to a depth of about 26 inches. Below that, there is hard level-bedded siltstone that has cracks filled with red clay loam and yellowish brown silt loam.

Natural fertility is low, and the content of organic matter is low. This soil is medium acid to very strongly acid throughout. Permeability is moderately rapid. The available water capacity is low. Runoff is medium, and erosion is a severe hazard if cultivated crops are grown. Grasses respond well to fertilizer.

Included with this soil in mapping are a few small areas of soils that are similar to Enders and Linker soils and a few small areas where bedrock is at a depth of less than 20 inches.

This soil is moderately suited to cultivated crops in the less sloping areas. Adapted crops include soybeans,

grain sorghum, and winter small grains. The main limitations are the severe hazard of erosion, droughtiness, and gravel fragments on the surface that can interfere with tillage. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

This soil is moderately suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include bermudagrass and tall fescue. The main limitations are droughtiness during the drier seasons and coarse fragments on the surface.

This soil is moderately suited to use as woodland. Adapted species include red oak, shortleaf pine, and loblolly pine. Seedling mortality is a moderate limitation.

This soil is moderately suited to poorly suited to most urban uses. The moderate depth to rock is a severe limitation for septic tank absorption fields. The moderate depth to rock is a moderate limitation for dwellings and local roads and streets. The moderate depth to rock and slope are moderate limitations for small commercial buildings. These limitations generally can be overcome by proper engineering design.

This soil is in capability unit IIIe-3 and in woodland suitability group 4f8.

62—Wallen gravelly silt loam, 8 to 12 percent slopes. This is a moderately deep, somewhat excessively drained, moderately sloping soil on side slopes and ridgetops in the Ozark Highlands. Individual areas range from about 25 to 350 acres in size.

Typically, the surface layer is dark brown gravelly silt loam about 3 inches thick. The subsurface layer is yellowish brown gravelly silt loam that extends to a depth of about 8 inches. The subsoil is yellowish brown very cobbly silt loam to a depth of about 18 inches and yellowish brown, mottled very cobbly silt loam to a depth of about 26 inches. Below that, there is hard level-bedded siltstone that has cracks filled with red clay loam and yellowish brown silt loam (fig. 9).

Natural fertility is low, and the content of organic matter is low. This soil is medium acid to very strongly acid throughout. Permeability is moderately rapid. The available water capacity is low. Runoff is rapid, and erosion is a very severe hazard if cultivated crops are grown. Grasses respond well to fertilizer.

Included with this soil in mapping are a few small areas of soils that are similar to Enders and Linker soils and a few small areas where bedrock is at a depth of less than 20 inches.

This soil is poorly suited to cultivated crops. The very severe hazard of erosion and coarse fragments are limitations.

This soil is moderately suited to use as pasture, and it is used mainly as pasture. Adapted pasture plants include bermudagrass and tall fescue. The main limitations are droughtiness during the drier seasons and coarse fragments on the surface.

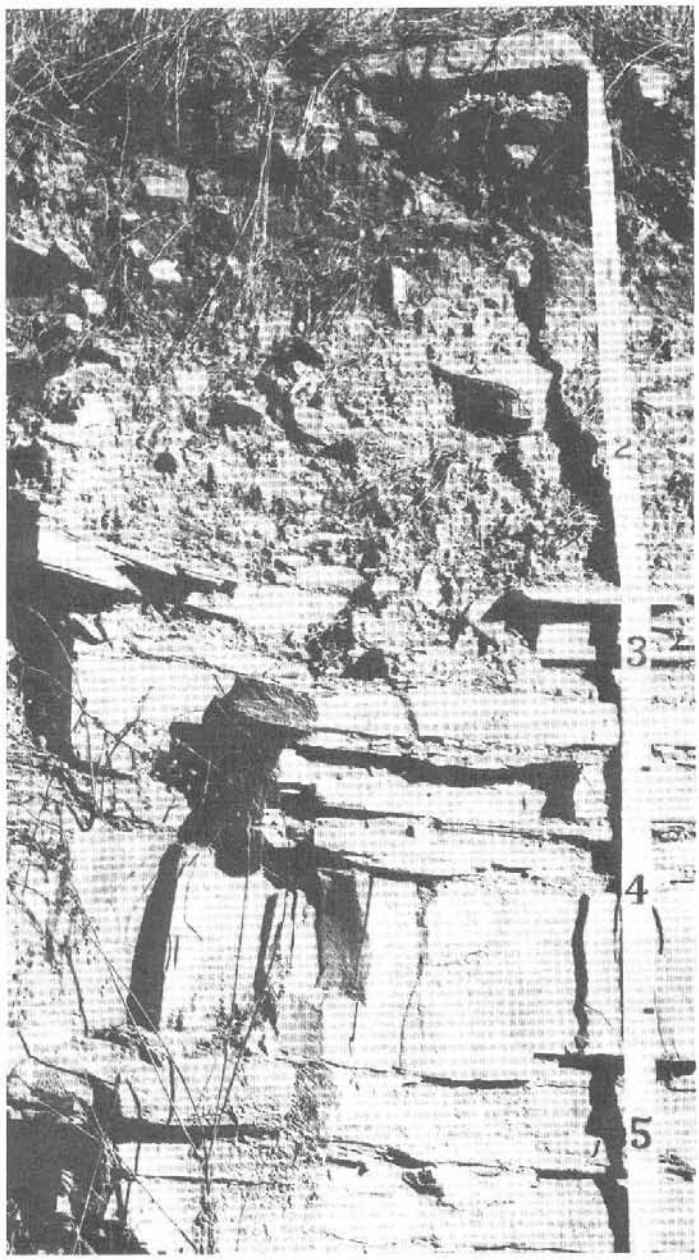


Figure 9.—Profile of Wallen gravelly silt loam, 8 to 12 percent slopes. The scale is in inches.

This soil is moderately suited to use as woodland. Adapted species include shortleaf pine and loblolly pine. The use of equipment is moderately limited, and seedling mortality is moderate.

This soil is moderately suited to poorly suited to most urban uses. The moderate depth to rock is a severe limitation for septic tank absorption fields. Slope and the moderate depth to rock are moderate limitations for

dwellings and local roads and streets. Slope is a severe limitation for small commercial buildings. The limitations generally can be overcome by proper engineering design.

This soil is in capability unit IVe-3 and in woodland suitability group 4f8.

63—Wallen gravelly silt loam, 12 to 30 percent slopes. This is a moderately deep, somewhat excessively drained, moderately steep to steep soil on side slopes in the Ozark Highlands. Individual areas range from about 25 to 500 acres in size.

Typically, the surface layer is dark brown gravelly silt loam about 3 inches thick. The subsurface layer is yellowish brown gravelly silt loam that extends to a depth of about 8 inches. The subsoil is yellowish brown very cobbly silt loam to a depth of about 18 inches and yellowish brown, mottled very cobbly silt loam to a depth of about 26 inches. Below that, there is hard level-bedded siltstone that has cracks filled with red clay loam and yellowish brown silt loam.

Natural fertility is low, and the content of organic matter is low. This soil is medium acid to very strongly acid throughout. Permeability is moderately rapid. The available water capacity is low. Runoff is rapid, and erosion is a very severe hazard. Grasses respond well to fertilizer.

Included with this soil in mapping are a few small areas of soils that are similar to Enders and Linker soils and a few small areas where bedrock is at a depth of less than 20 inches. Also included are a few areas where the soil has large stones on the surface.

This soil is not suited to cultivated crops.

This soil is poorly suited to use as pasture. Nevertheless, it is used mainly as pasture. Adapted pasture plants include bermudagrass and tall fescue. The main limitations are steep slopes and droughtiness during the drier seasons.

This soil is moderately suited to use as woodland. Adapted species include red oak, shortleaf pine, and loblolly pine. Erosion is a moderate hazard, the use of equipment is severely limited, and seedling mortality is high. These limitations can be partly overcome by confining logging operations to the less sloping areas and by using special equipment.

This soil is poorly suited to most urban uses. Slope and the moderate depth to rock are severe limitations for septic tank absorption fields. Slope is a severe limitation for dwellings, small commercial buildings, and local roads and streets. The limitations generally are difficult or impractical to overcome.

This soil is in capability unit VIIe-2 and in woodland suitability group 4f9.

64—Wideman loamy fine sand, frequently flooded. This is a deep, excessively drained, level soil on flood plains and natural levees along streams. Individual areas range from about 10 to 200 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is brown loamy fine sand about 4 inches thick. The subsurface layer is dark yellowish brown fine sandy loam that extends to a depth of about 10 inches. The underlying material is yellowish brown fine sand to a depth of about 21 inches; dark yellowish brown fine sand to a depth of 30 inches; light yellowish brown fine sand to a depth of about 40 inches; dark yellowish brown fine sandy loam to a depth of about 44 inches; dark yellowish brown loamy fine sand to a depth of about 52 inches; light yellowish brown loamy fine sand to a depth of about 64 inches; and dark yellowish brown fine sandy loam to a depth of about 72 inches.

Natural fertility is low, and the content of organic matter is low. The surface and subsurface layers are neutral to extremely acid, and the underlying material is mildly alkaline to strongly acid. Permeability is moderately rapid. The available water capacity is low. This soil is frequently flooded for brief periods late in winter and early in spring. Grasses respond well to fertilizer.

Included with this soil in mapping are a few small areas of Arrington, Secesh, and Sturkie soils. Also included are a few small areas of a soil that is similar to this Wideman soil except that the subsoil is finer textured.

This soil generally is not suited to cultivated crops because of flooding.

This soil is moderately suited to use as pasture. Adapted pasture plants include bermudagrass and tall fescue. Frequent flooding is a moderate hazard late in winter and early in spring. This limitation can be minimized by restricting grazing to the drier seasons.

This soil is well suited to use as woodland. Adapted species are eastern cottonwood, American sycamore, loblolly pine, shortleaf pine, and sweetgum. Droughtiness is a moderate limitation for seedlings, and the sand is a moderate limitation for the use of logging equipment. The hazard of flooding is also a limitation.

This soil is severely limited for most urban uses. Frequent flooding is a severe limitation for septic tank filter fields, dwellings, small commercial buildings, and local roads and streets.

This soil is in capability unit Vw-1 and in woodland suitability group 3s8.

prime farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in Independence County are listed.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in providing the nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, state, and federal levels, as well as individuals, must encourage and facilitate the wise use of our nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to producing food, feed, forage, fiber, and oilseed crops. Such soils have properties that are favorable for the economic production of sustained high yields of crops. The soils need only to be treated and managed using acceptable farming methods. The moisture supply, of course, must be adequate, and the growing season has to be sufficiently long. Prime farmland soils produce the highest yields with minimal inputs of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may be in other uses. They either are used for producing food or fiber or are available for these uses. Urban or built-up land and water areas cannot be considered prime farmland.

Prime farmland soils usually get an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not flooded during the growing season. The slope ranges mainly from 0 to 6 percent.

Soils that have a high water table, are subject to flooding, or are droughty may qualify as prime farmland soils if the limitations or hazards are overcome by drainage, flood control, or irrigation. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information on the criteria for prime farmland soils can be obtained at the local office of the Soil Conservation Service.

Nearly 25 percent of the county, about 120,000 acres, is prime farmland. Most of the prime farmland is in the eastern one-third of the county, mainly in map units 5, 7, 8, and 9 on the general soil map. About 85,000 acres of the prime farmland in the county is used for crops. The main crops are soybeans, rice, sorghum, and wheat.

A recent trend in land use has been the conversion of some prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are wet, more erodible, droughty, or difficult to cultivate and less productive than prime farmland.

The following map units, or soils, make up prime farmland in Independence County. Some areas of these soils, however, are used as urban or built-up land. Urban or built-up land is defined as any contiguous unit of land 10 acres or more in size that is used for nonfarm uses, including housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water control structures. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 6. The soil qualities that affect use and management are described in the section "Detailed soil map units." This list does not constitute a recommendation for a particular land use.

3	Arrington silt loam, gently undulating
4	Askew silt loam, gently undulating
9	Captina silt loam, 1 to 3 percent slopes
15	Crowley silt loam, 0 to 1 percent slopes
16	Dubbs silt loam, gently undulating
17	Egam silt loam, 0 to 1 percent slopes
18	Egam silty clay loam, occasionally flooded
28	Hontas silt loam, occasionally flooded
29	Jackport silty clay loam, 0 to 1 percent slopes
30	Lily fine sandy loam, 3 to 8 percent slopes
33	Linker fine sandy loam, 3 to 8 percent slopes
35	Linker gravelly fine sandy loam, 3 to 8 percent slopes
38	Loring silt loam, 1 to 3 percent slopes
50	Portia fine sandy loam, 3 to 8 percent slopes
55	Sidon silt loam, 1 to 3 percent slopes
58	Spadra fine sandy loam, 0 to 1 percent slopes
60	Taft silt loam, 0 to 2 percent slopes

use and management of the soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

crops and pasture

Tom Burkett, agronomist, Soil Conservation Service, helped to prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed soil map units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

In 1974, about 16 percent of the county was used for crops and about 34 percent was used for pasture and hay. The soils in Independence County are well suited to not suited to use as cropland and pasture. The food production capacity of most soils could be increased considerably by extending the latest crop production technology to all cropland in the county.

The soils in Independence County, except for those on bottom lands of the Black River and White River, are low in nitrogen, potassium, phosphorus, calcium, and organic matter. Many of the soils that are suitable for cultivation are erodible. In places, wetness and flooding are limitations.

Minimum tillage, contour farming, terraces, and grassed waterways are needed on soils where erosion is a hazard. Proper arrangement of rows and suitable drainage are needed for dependable plant growth in wet areas.

Annual cover crops, grasses, and legumes should be included regularly in the cropping system if erosion is a severe hazard or if the crop does not leave a large amount of residue. Crop residue should be left on the surface to provide a protective cover for the soils. Annual cover crops that follow a harvest leave a small amount of residue that protects the soil from erosion and adds organic matter.

A plowpan normally develops in loamy soils that are improperly tilled or tilled frequently with heavy equipment. Keeping tillage to a minimum, varying the depth of tillage, and tilling at the proper moisture content help prevent the formation of a plowpan. Growing deep-rooted grasses and legumes in the cropping system helps break up a plowpan.

If left bare, loamy soils tend to crust, pack, and puddle during periods of heavy rainfall. Growing cover crops and managing crop residue help maintain good tilth. Soils that have a clayey surface layer can be tilled only within a narrow range of moisture content.

Soybeans, rice, wheat, and grain sorghum are the

major crops in the county. Corn and hay and strawberries, peaches, pecans, vegetables, and other specialty crops are grown in small acreages.

Fertilizer and lime should be applied in amounts determined by soil tests and the kind of crop to be grown.

Coastal bermudagrass and common bermudagrass are the summer perennials commonly grown in the county. Coastal bermudagrass is fairly new to the county and produces good quality forage. Tall fescue is the winter perennial grass most commonly grown in the county. Many of the soils are suited to johnsongrass. Alfalfa, annual lespedeza, and clovers are the most commonly grown legumes and generally are grown in combination with grasses. All of the grasses respond well to fertilizer, particularly nitrogen.

Controlled grazing is essential for the production of high-quality forage and for stand survival and erosion control. Brush and weed control, fertilizer, and renovation of the pasture are needed in places.

yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 7. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that insures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 7 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

land capability classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in

class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-1 or IIIe-2.

The capability classification of each map unit is given in the section "Detailed soil map units."

woodland management and productivity

Paul I. Brown, forester, Soil Conservation Service, helped prepare this section.

Independence County was once covered with trees. The land was cleared for agriculture, and by 1953 the vast forest had been reduced to about 259,400 acres, or about 54 percent of the county (*4*). Clearing has continued; in 1979 the total forested acreage was 223,200 acres, or about 46 percent of the total land area (*6*). Land use patterns now appear to be relatively stable, although some additional clearing in the bottom lands of the White and Black Rivers can be expected.

There are poor to fair stands of trees throughout the county. The woodland south of the White River consists mainly of a mixture of broad-leaved and needle-leaved trees. The most common species are shortleaf pine, southern red oak, white oak, post oak, and hickory. The trees in other parts of the county are mainly broad-leaved; however, there are some eastern redcedars in scattered glades in the northwestern part of the county. Black oak is predominant in areas of cherty limestone. Southern red oak, white oak, post oak, and hickory are predominant on the uplands, and sycamore, willow oak, swamp chestnut oak, pecan, and shagbark hickory are predominant on the bottom lands along the major streams.

The major forest types in the county are: Loblolly-Shortleaf Pine, 24,800 acres; Oak-Pine, 37,200 acres; and Oak-Hickory, 161,200 acres. The forest land in Independence County is owned almost entirely by nonindustrial private landowners. Public and industrial ownership amounts to less than 10,000 acres (*6*).

The value of wood products is significant, although it is well below the potential. In 1978, the volume of growing stock for all species was about 120.6 million cubic feet (*9*). Forest products include pulpwood, crossties, posts, and saw logs. The forests in Independence County provide valuable pasture for livestock, habitat for wildlife, and areas for recreation. They also help in the conservation of soil and water.

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the woodland suitability group for each soil. Soils assigned to the same woodland suitability group require the same general management and have about the same potential productivity.

The first part of the *woodland suitability group*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low.

The second part, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: x, w, t, d, c, s, f, and r.

The third element of the woodland suitability group, a number, indicates the kind of trees for which the soils in the group are best suited and also indicates the severity of the limitation. The numbers 1, 2, and 3 indicate slight, moderate, and severe limitations, respectively, and suitability for needle-leaved trees. The numbers 4, 5, and 6 indicate slight, moderate, and severe limitations, respectively, and suitability for broad-leaved trees. The numbers 7, 8, and 9 indicate slight, moderate, and severe limitations, respectively, and suitability for both needle-leaved and broad-leaved trees.

In table 8, *slight, moderate,* and *severe* under "Management concerns" indicate the degree of the listed hazards and limitations.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than

25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. Site index was determined at age 30 years for eastern cottonwood, 35 years for American sycamore, and 50 years for all other species. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

recreation

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking, horseback riding, and bicycling should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

wildlife habitat

Robert G. Price, biologist, Soil Conservation Service, helped prepare this section.

Independence County includes parts of the Ozark Mountains, the Boston Mountains, and the Delta. Upland areas of the Interior Highlands are mingled with lowlands of the Coastal Plain. The county offers scenic variety as well as a diversity of habitat for wildlife.

Woodland makes up 46 percent of the county and is mainly a mixed stand of oak-hickory and pine. The most common species are shortleaf pine, southern red oak, white oak, post oak, and hickory. There are some scattered glades of eastern redcedar. Black oak is predominant in the cherty limestone areas. Sycamore, willow oak, swamp chestnut oak, pecan, and shagbark hickory are predominant on the bottom lands of the major streams. The forests support white-tailed deer, wild turkey, gray squirrel, fox squirrel, gray fox, bobcat, opossum, coyote, raccoon, and numerous species of songbirds.

Grassland makes up about 34 percent of Independence County and cropland about 13 percent. The grassland areas are surrounded by woods and shrub borders. These border areas provide excellent food and cover for quail, cottontail, songbirds, white-tailed deer, and other species that need grassland as part of their habitat. Unmanaged pasture, old fields, and thinned woodlots produce numerous native woody and herbaceous plants important as food and cover for

white-tailed deer, rabbit, and other species, including quail. Cropland interspersed with other types of land provides favorable habitat for bobwhite quail. Mourning dove, red fox, striped skunk, red-tailed hawk, and many songbirds favor fields, fencerows, shrubby field borders, and woodland edges.

The lowlands support a variety of furbearers, including muskrat, beaver, mink, raccoon, gray fox, striped skunk, and coyote.

Rainbow and brown trout are plentiful in the upper part of the White River, smallmouth bass in many small tributaries, and rock bass, bluegill, and redear sunfish in numerous small mountain streams. The many lakes and ponds in the county are stocked with bluegill, white crappie, black crappie, largemouth bass, spotted bass, channel catfish, blue catfish, and flathead catfish.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine and cedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild

herbaceous plants. The wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, shore birds, muskrat, mink, and beaver.

engineering

James L. Janski, assistant state conservation engineer, Soil Conservation Service, helped prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

building site development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made

for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

sanitary facilities

Table 12 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils.

Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

construction materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and

cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

water management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

soil properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

engineering index properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture (*3*). These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains particles coarser than sand, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

physical and chemical properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 16, the estimated content of organic matter of the plow layer is expressed as a percentage, by weight,

of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

soil and water features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt and water in swamps and marshes are not considered flooding.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An artesian water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of

corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*5*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 18, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aqualf (*Aqu*, meaning wetness, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalf (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that have an udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, thermic Typic Hapludalfs.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

soil series and their morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (*3*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*5*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed soil map units."

Amagon series

The Amagon series consists of deep, poorly drained, slowly permeable, level soils on the lower part of natural levees and in shallow depressions along natural drainageways on the bottom lands of the Black and White Rivers. The soils formed in loamy alluvial sediment. They are frequently flooded and are saturated with water late in winter and early in spring. The native vegetation was hardwood trees, mainly water-tolerant oaks. Slopes are 0 to 1 percent.

Amagon soils are geographically associated with Askew, Crowley, Dubbs, Forestdale, Foley, and Jackport

soils. Askew soils are on natural levees at a higher elevation than the Amagon soils and are moderately well drained. Crowley soils are on terraces also at a higher elevation; they have a fine control section and an abrupt texture change. Dubbs soils are on natural levees at a higher elevation and are well drained. Forestdale soils are in positions on the landscape similar to those of Amagon soils; they have a fine control section. Foley soils are on terraces at a higher elevation and have a natric horizon and glossic properties. Jackport soils are also on terraces at a higher elevation and have a very-fine control section and vertic properties.

Typical pedon of Amagon silt loam, frequently flooded, in a moist cultivated field in the NE1/4SE1/4NE1/4 sec. 3, T. 13 N., R. 3 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint yellowish brown mottles; weak medium granular structure; very friable; strongly acid; abrupt smooth boundary.

A2g—6 to 16 inches; gray (10YR 6/1) silt loam; common medium distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; few fine dark concretions; friable; strongly acid; clear wavy boundary.

B21tg—16 to 29 inches; gray (10YR 6/1) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; common patchy clay films; common black stains; common fine dark concretions; strongly acid; clear wavy boundary.

B22tg—29 to 41 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium distinct gray (10YR 5/1) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common patchy clay films; common black stains; common fine dark concretions; medium acid; clear wavy boundary.

B3g—41 to 57 inches; gray (10YR 6/1) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; firm; common fine dark concretions; neutral; clear wavy boundary.

Cg—57 to 72 inches; gray (10YR 5/1) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) mottles; massive; firm; common fine dark concretions; mildly alkaline.

The solum ranges in thickness from 50 to 70 inches or more. The A and B2t horizons are medium acid to very strongly acid, and the B3 and C horizons are mildly alkaline to strongly acid.

The A horizon ranges from 10 to 20 inches in thickness. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The A2g horizon has hue of 10YR, value of 6, and chroma of 1 or 2.

The B2tg horizon has hue of 10YR, value of 6, and chroma of 1 or 2, or it has hue of 2.5Y, value of 5 or 6, and chroma of 2. Mottles in shades of brown, gray, and yellow are few to common. The B2tg horizon is silt loam or silty clay loam. The B3g horizon, where present, has hue of 10YR, value of 5, 6, or 7, and chroma of 1 or value of 4 or 5 and chroma of 2. It is silt loam or silty clay loam.

The Cg horizon is similar in color to the B3g horizon. It is silt loam, silty clay loam, or loam.

Arkana series

The Arkana series consists of moderately deep, well drained, very slowly permeable, gently sloping soils on ridges, benches, and side slopes in the Ozark Highlands. The soils formed in clayey residuum of cherty limestone bedrock. The native vegetation was hardwood trees. Slopes range from 3 to 8 percent.

Arkana soils are geographically associated with Clarksville, Gepp, Moko, and Noark soils. Clarksville soils are on ridgetops and side slopes at a higher elevation than Arkana soils; they have a loamy-skeletal control section and are deep to bedrock. Gepp soils are also on ridgetops and side slopes at a higher elevation; they do not have a mollic-colored surface layer and are deep to bedrock. Moko soils are on benches and ridgetops, have a loamy-skeletal control section, and are shallow to bedrock. Noark soils are on ridgetops and side slopes at a higher elevation, have a clayey-skeletal control section, and are deep to bedrock.

Typical pedon of Arkana silt loam, in an area of Arkana-Moko complex, 3 to 8 percent slopes, in a moist wooded area in the SW1/4SE1/4NE1/4 sec. 34, T. 15 N., R. 5 W.

O1—1 inch to 0; leaves, leaf mold, twigs, roots.

A11—0 to 4 inches; very dark gray (10YR 3/1) cherty silt loam; weak medium granular structure; very friable; many fine and medium roots; about 15 percent, by volume, siltstone, chert, and limestone fragments; neutral; abrupt wavy boundary.

A12—4 to 6 inches; dark brown (10YR 3/3) cherty silt loam; moderate medium granular structure; friable; common fine and medium roots; many fine pores; about 15 percent, by volume, siltstone, limestone, and chert fragments; neutral; clear wavy boundary.

B21t—6 to 12 inches; yellowish red (5YR 4/6) silty clay; moderate medium subangular blocky structure; firm; common patchy clay films; common fine roots and pores; about 10 percent, by volume, siltstone and chert fragments; slightly acid; clear wavy boundary.

B22t—12 to 20 inches; red (2.5YR 4/6) clay; few fine yellowish brown mottles; moderate medium subangular blocky structure; firm, plastic; common patchy clay films on faces of peds; few fine roots and pores; about 10 percent, by volume, siltstone and chert fragments; slightly acid; clear wavy boundary.

B23t—20 to 24 inches; dark yellowish brown (10YR 4/4) clay; common medium distinct light olive brown (2.5Y 5/4) and yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; firm, plastic; common patchy clay films on faces of peds; few fine roots; about 5 percent, by volume, limestone and siltstone fragments; mildly alkaline; abrupt smooth boundary.

R—24 to 26 inches; hard level-bedded limestone bedrock.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. The A horizon is mildly alkaline to medium acid, and the Bt horizon is moderately alkaline to strongly acid.

The A horizon ranges from 6 to 12 inches in thickness. It has hue of 10YR, value of 2 or 3, and chroma of 1, 2, or 3. The A2 horizon, where present, has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Coarse fragments make up 15 to 35 percent of the volume.

The B21t and B22t horizons have hue of 5YR or 2.5YR, value of 4, 5, or 6, and chroma of 4, 6, or 8. They are silty clay or clay. Coarse fragments make up 5 to 25 percent of the volume.

The B23t horizon has hue of 10YR through 5YR, value of 4, 5, or 6, and chroma of 4, 6, or 8. Mottles are in shades of red and brown. The B23t horizon is clay. It is 5 to 15 percent coarse fragments.

Arrington series

The Arrington series consists of deep, well drained, moderately permeable, gently undulating soils on natural levees on bottom lands of the White River. These soils formed in recent loamy alluvium. The native vegetation was hardwood trees. Slopes are 0 to 3 percent.

Arrington soils are geographically associated with Egam, Hontas, and Wideman soils. Egam soils are on flood plains at a slightly lower elevation than the Arrington soils, are moderately well drained, and have a fine control section. Hontas soils are in lower positions on the landscape, are moderately well drained, and do not have a mollic epipedon. Wideman soils are on bends and curves of streams, have a sandy control section, and do not have a mollic epipedon.

Typical pedon of Arrington silt loam, gently undulating, in a moist cultivated area in the NE1/4SW1/4NW1/4 sec. 12, T. 12 N., R. 5 W.

Ap—0 to 6 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; very friable; many fine roots; slightly acid; gradual smooth boundary.

A12—6 to 24 inches; dark brown (10YR 3/3) silt loam; weak medium granular structure; very friable; many fine roots; mildly alkaline; gradual wavy boundary.

B21—24 to 35 inches; dark brown (10YR 3/3) silt loam; weak medium subangular blocky structure parting to weak medium granular; friable; few fine soft black concretions; mildly alkaline; gradual smooth boundary.

B22—35 to 46 inches; dark brown (10YR 3/3) silty clay loam; few fine faint brown mottles; weak medium subangular blocky structure; friable; few small black concretions; neutral; gradual smooth boundary.

B3—46 to 54 inches; dark brown (10YR 4/3) silt loam; few fine faint dark brown mottles; weak medium subangular blocky structure parting to weak fine granular; friable; mildly alkaline; gradual smooth boundary.

C—54 to 72 inches; dark brown (10YR 4/3) loam; few fine and medium faint dark yellowish brown (10YR 4/4) and distinct grayish brown (10YR 5/2) mottles; weak medium granular structure; very friable; few soft black masses; mildly alkaline.

The solum is 40 to 60 inches thick. Reaction is mildly alkaline to slightly acid throughout.

The A horizon is 24 to 36 inches thick. The Ap and A12 horizons have hue of 10YR, value of 3, and chroma of 2 or 3. In some places they have few faint dark brown and brown mottles.

The B horizon has hue of 10YR, value of 3 or 4, and chroma of 3 or 4. In some places it has mottles in shades of brown or yellowish brown. The B horizon is silt loam, silty clay loam, or loam.

The C horizon is similar in color and texture to the B horizon.

Askew series

The Askew series consists of deep, moderately well drained, moderately permeable, gently undulating soils on natural levees along former stream channels on bottom lands of the Black River. The soils formed in loamy alluvium. The native vegetation was hardwood trees. Slopes are 0 to 3 percent.

Askew soils are geographically associated with Amagon, Dubbs, and Forestdale soils. Amagon soils are on natural levees at a lower elevation than the Askew soils and are poorly drained. Forestdale soils are in level to depressed areas on natural levees at a lower elevation, have a fine control section, and are poorly drained. Dubbs soils are on the higher part of natural levees and are well drained.

Typical pedon of Askew silt loam, gently undulating, in a moist cultivated field in the NW1/4NE1/4NW1/4 sec. 8, T. 14 N., R. 2 W.

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam; weak fine and medium granular structure; very friable; few fine roots; medium acid; abrupt smooth boundary.

B21t—5 to 14 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct dark yellowish brown (10YR 4/4) and pale brown (10YR 6/3) mottles and few fine distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few patchy clay films on faces of peds; few fine roots; strongly acid; clear wavy boundary.

B22t—14 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct light brownish gray (10YR 6/2), yellowish brown (10YR 5/6), and dark yellowish brown (10YR 3/4) mottles; moderate medium subangular blocky structure; firm; few patchy clay films on faces of peds; few fine hard dark concretions; few fine roots; strongly acid; gradual wavy boundary.

B23t—25 to 36 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; few patchy clay films on faces of peds; few fine hard dark concretions; strongly acid; clear wavy boundary.

B24t—36 to 42 inches; grayish brown (10YR 5/2) silty clay loam; many medium distinct dark yellowish brown (10YR 4/4) and light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; common clay films; few fine hard dark concretions; strongly acid; clear wavy boundary.

C1—42 to 58 inches; gray (10YR 5/1) silt loam; common medium distinct dark yellowish brown (10YR 3/4) and light brownish gray (10YR 6/2) mottles; massive; firm; common fine hard dark concretions; medium acid; clear wavy boundary.

C2—58 to 72 inches; gray (10YR 5/1) silt loam; many medium distinct dark yellowish brown (10YR 3/4) and few medium distinct light brownish gray (10YR 6/2) mottles; massive; firm; common fine hard dark concretions; medium acid.

Solum is 22 to 42 inches thick. Reaction ranges from medium acid to very strongly acid throughout.

The A horizon is 5 to 12 inches thick. The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The upper part of the Bt horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Mottles are few to common and are in shades of brown or gray. The lower part has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Mottles are common to many and are in shades of gray and brown. The Bt horizon is silt loam, silty clay loam, or loam.

The C horizon is similar in color to the Bt horizon. It is silt loam, silty clay loam, loam, or fine sandy loam.

Boden series

The Boden series consists of deep, well drained, moderately slowly permeable, gently sloping to moderately steep soils on ridgetops and side slopes in the Ozark Highlands. These soils formed in residuum of sandstone bedrock. The native vegetation was mainly mixed hardwoods and pine. Slopes are 3 to 20 percent.

Boden soils are geographically associated with Brockwell, Lily, and Portia soils. Brockwell soils are on adjacent similar landscapes at a lower elevation than the Boden soils; they have a coarse-loamy control section. Lily soils are on adjacent ridges and side slopes at a lower elevation; they have a fine-loamy control section and are moderately deep to bedrock. Portia soils are on adjacent similar landscapes at a lower elevation and have a fine-loamy control section.

Typical pedon of Boden fine sandy loam, 3 to 8 percent slopes, in a pasture in the SW1/4SE1/4SW1/4 sec. 15, T. 14 N., R. 4 W.

Ap1—0 to 3 inches; dark brown (10YR 4/3) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; many fine and medium pores; about 5 percent, by volume, sandstone pebbles and fragments 1/8 to 1/2 inch in diameter; strongly acid; abrupt smooth boundary.

Ap2—3 to 8 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; many fine and medium pores; about 5 percent, by volume, sandstone pebbles and fragments 1/8 to 1 inch in diameter; very strongly acid; clear wavy boundary.

A2—8 to 12 inches; strong brown (7.5YR 5/6) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; many fine pores; about 5 percent, by volume, sandstone pebbles and fragments 1/8 to 1 inch in diameter; very strongly acid; clear wavy boundary.

B1—12 to 22 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; about 5 percent, by volume, sandstone fragments 1/2 to 1 inch in diameter; very strongly acid; gradual wavy boundary.

B2t—22 to 38 inches; red (2.5YR 4/6) sandy clay; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; continuous distinct clay films on faces of peds; about 5 percent, by volume, sandstone fragments 1/2 to 1 inch in diameter; very strongly acid; gradual irregular boundary.

B3—38 to 44 inches; red (2.5YR 4/6) sandy clay; common medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few fine pores; about 5 percent, by volume, sandstone fragments 1/2 inch to 2 inches in diameter; thin streaks or bands of light gray (10YR 7/2) sandy clay loam; very strongly acid; gradual irregular boundary.

C—44 to 56 inches; red (2.5YR 4/6) sandy clay loam; common medium prominent yellowish brown (10YR 5/8) and pale brown (10YR 6/3) mottles; massive; firm; many fine pores; about 10 percent, by volume, sandstone fragments 1/2 inch to 2 inches in diameter; thin streaks or bands of light gray (10YR 7/2) sandy loam; very strongly acid; clear smooth boundary.

R—56 inches; level-bedded acid sandstone bedrock.

Thickness of the solum ranges from 36 to 50 inches. Depth to bedrock ranges from 40 to 60 inches. The soil is strongly acid or very strongly acid throughout.

The A horizon ranges from 7 to 14 inches in thickness. The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4, or it has hue of 7.5YR, value of 5, and chroma of 6. Sandstone pebbles make up 0 to 25 percent of the volume. The A horizon is fine sandy loam or stony fine sandy loam.

The B1 horizon has hue of 7.5YR, value of 5, and chroma of 6 or 8, or it has hue of 5YR, value of 4 or 5, and chroma of 6 or 8. It is fine sandy loam or sandy clay loam. The B2t and B3 horizons have hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. Mottles in the lower part of the B2t horizon and in the B3 horizon, where present, are in shades of brown. Sandstone fragments make up 5 to 15 percent of the volume. The B2t and B3 horizons are sandy clay loam, sandy clay, or clay.

The C horizon, where present, is similar in color to the B2t horizon, or it is mottled in shades of red and brown. Sandstone fragments make up 0 to 10 percent of the volume. The C horizon is sandy loam or sandy clay loam.

Brockwell series

The Brockwell series consists of deep, well drained, moderately permeable, gently sloping soils on ridgetops and upper side slopes in the Ozark Highlands. The soils formed in residuum of sandstone. The native vegetation was mixed hardwoods and pine. Slopes are 3 to 8 percent.

Brockwell soils are geographically associated with Boden, Lily, Portia, and Ramsey soils. Boden soils are on adjacent similar landscapes at a higher elevation than the Brockwell soils and have a clayey control section. Lily soils also are on adjacent similar landscapes at a higher elevation; they have a fine-loamy control section and are moderately deep to bedrock. Portia soils are on similar landscapes and have a fine-loamy control section. Ramsey soils are on similar landscapes, are shallow to bedrock, and do not have an argillic horizon.

Typical pedon of Brockwell fine sandy loam, 3 to 8 percent slopes, in the SE1/4NW1/4NE1/4 sec. 35, T. 15 N., R. 6 W.

Ap—0 to 8 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; many fine and medium pores; medium acid; clear smooth boundary.

A2—8 to 14 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; many fine and medium pores; about 5 percent, by volume, angular sandstone fragments; strongly acid; clear wavy boundary.

B21t—14 to 32 inches; strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; discontinuous clay films on faces of peds; many fine roots; many fine pores; about 5 percent, by volume, angular sandstone fragments; strongly acid; clear wavy boundary.

B22t—32 to 48 inches; strong brown (7.5YR 5/6) fine sandy loam; common medium distinct pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; very friable; thin discontinuous clay films on faces of peds; many fine and medium pores; about 5 percent, by volume, angular sandstone fragments; very strongly acid; gradual wavy boundary.

B23t—48 to 60 inches; strong brown (7.5YR 5/6) fine sandy loam; common medium prominent pale brown (10YR 6/3) and few fine prominent yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; very friable; bridgings and coatings on sand grains; many fine pores; few pockets of uncoated sand grains; very strongly acid; gradual irregular boundary.

B24t—60 to 80 inches; mottled yellowish red (5YR 5/6), strong brown (7.5YR 5/6), and yellowish brown (10YR 5/6) fine sandy loam; weak coarse subangular blocky structure; very friable; bridgings and coatings on sand grains; few to common pockets of uncoated sand grains; medium acid.

The solum is 60 to 80 inches thick. The soil is medium acid to very strongly acid throughout.

The A horizon is 6 to 16 inches thick. The Ap horizon, or the A2 horizon, where present, has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Sandstone fragments make up 0 to 10 percent of the volume.

The B1 horizon, where present, has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. The B2t

horizon has hue of 7.5YR, value of 4, and chroma of 4 or value of 5 and chroma of 4 or 6. The lower part of the B2t horizon is commonly mottled in shades of brown or red. The B2t horizon is fine sandy loam or sandy clay loam. Gravel makes up 0 to 15 percent of the volume.

Captina series

The Captina series consists of deep, moderately well drained, slowly permeable, nearly level to gently sloping soils on uplands and stream terraces in the Ozark Highlands. These soils formed in residuum of cherty limestone, thin loess deposits, or old valley fill. The native vegetation was mixed hardwoods and pine. Slopes are 1 to 8 percent.

Captina soils are geographically associated with Clarksville and Wallen soils, which are on ridgetops and side slopes at a higher elevation than the Captina soils. They have a loamy-skeletal control section and do not have a fragipan.

Typical pedon of Captina silt loam, 3 to 8 percent slopes, in a moist wooded area in the NW1/4NW1/4SW1/4 sec. 29, T. 14 N., R. 7 W.

A1—0 to 2 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; very friable; strongly acid; clear smooth boundary.

A2—2 to 6 inches; brown (10YR 5/3) silt loam; weak medium granular structure; very friable; strongly acid; clear wavy boundary.

B21t—6 to 24 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; thin patchy clay films on faces of peds; very strongly acid; clear wavy boundary.

Bx1—24 to 32 inches; strong brown (7.5YR 5/6) silt loam; common medium distinct gray (10YR 6/1) and few fine prominent yellowish red (5YR 5/6) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, hard, compact and brittle; patchy distinct clay films on faces of peds; about 5 percent, by volume, chert fragments; very strongly acid; gradual wavy boundary.

Bx2—32 to 50 inches; mottled yellowish red (5YR 4/6), yellowish brown (10YR 5/6), and gray (10YR 6/1) cherty silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, hard, compact and brittle; patchy distinct clay films on faces of peds; about 15 percent, by volume, chert fragments; very strongly acid; gradual irregular boundary.

Bx3—50 to 62 inches; mottled yellowish red (5YR 4/6), yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and gray (10YR 6/1) very cherty silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, hard, compact and brittle; patchy distinct clay films on faces of peds; about 45 percent, by volume, chert fragments; very strongly acid; gradual irregular boundary.

B2t&Cr—62 to 72 inches; mottled yellowish red (5YR 4/6), strong brown (7.5YR 5/6), and gray (10YR 6/1) very cherty silty clay loam in seams and fractures of partly weathered bedded chert; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds and on chert fragments; about 75 percent, by volume, chert fragments; very strongly acid.

Depth to the B2t&Cr horizon ranges from 40 to 72 inches. The soil is strongly acid to very strongly acid throughout. Depth to the fragipan ranges from 18 to 30 inches.

The A horizon ranges from 5 to 10 inches in thickness. The A horizon has hue of 10YR, value of 4, and chroma of 2 or 3 or value of 5 and chroma of 3 or 4.

The B1 horizon, where present, has hue of 10YR, value of 5, and chroma of 4 or 6. It is silt loam or silty clay loam. The B2t horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4, 6, or 8. In some places the lower part has brown and red mottles. The B2t horizon is silt loam or silty clay loam.

The Bx horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8. Mottles are in shades of gray and red, or the horizon is mottled in shades of brown, gray, red, and yellow. The Bx horizon is silt loam or silty clay loam or a cherty or very cherty phase. The upper part of the Bx horizon is 0 to 15 percent, by volume, angular chert fragments, and the lower part is 0 to 75 percent angular chert fragments.

The B2t part of the B2t&Cr horizon is similar in color to the Bx horizon. It is very cherty silt loam or very cherty silty clay loam. Coarse fragments make up 50 to 90 percent of the volume.

Clarksville series

The Clarksville series consists of deep, somewhat excessively drained, moderately rapidly permeable, gently sloping to steep soils on side slopes and narrow ridgetops in dissected hilly areas in the Ozark Highlands. The soils formed in residuum of cherty limestone and cherty dolomite. The native vegetation was mixed hardwood trees. Slopes are 3 to 40 percent.

Clarksville soils are geographically associated with Arkana, Captina, Gepp, and Noark soils. Arkana soils are on lower adjacent side slopes and foot slopes, are moderately deep to bedrock, and have a very-fine

control section. Captina soils are on uplands and stream terraces at a lower elevation, have a fine-silty control section, and have a fragipan. Gepp soils are on side slopes and ridgetops at a lower elevation, have a very-fine control section, and are well drained. Noark soils are on side slopes and ridgetops at a lower elevation, have a clayey-skeletal control section, and are well drained.

Typical pedon of Clarksville very cherty silt loam, 20 to 40 percent slopes, in a moist wooded area in the NW1/4SE1/4NE1/4 sec. 16, T. 14 N., R. 6 W.

A1—0 to 3 inches; dark grayish brown (10YR 4/2) very cherty silt loam; weak fine granular structure; very friable; common fine and medium roots; few wormholes and wormcasts; about 35 percent, by volume, chert and siltstone fragments 1/2 inch to 3 inches in diameter; very strongly acid; abrupt smooth boundary.

A2—3 to 14 inches; pale brown (10YR 6/3) very cherty silt loam; weak fine granular structure; very friable; common fine and medium roots; few wormholes; few fine and medium pores; about 35 percent, by volume, chert and siltstone fragments; very strongly acid; clear wavy boundary.

B1—14 to 24 inches; yellowish brown (10YR 5/4) very cherty silty clay loam; weak medium subangular blocky structure; friable; some pale brown material from A2 horizon in old root channels; about 35 percent, by volume, chert and siltstone fragments; very strongly acid; clear wavy boundary.

B21t—24 to 36 inches; strong brown (7.5YR 5/6) very cherty silty clay loam; weak medium subangular blocky structure; friable; continuous distinct clay films on faces of peds; about 60 percent, by volume, chert and siltstone fragments; pockets of pale brown and yellowish brown material from the A2 and B1 horizons; very strongly acid; clear wavy boundary.

B22t—36 to 50 inches; strong brown (7.5YR 5/6) very cherty silty clay loam; weak medium subangular blocky structure; friable; continuous distinct clay films on faces of peds; few fine pores; about 65 percent, by volume, chert and siltstone fragments; very strongly acid; clear wavy boundary.

B23t—50 to 72 inches; yellowish red (5YR 5/6) very cherty silty clay loam; common medium prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; continuous distinct clay films on faces of peds; about 70 percent, by volume, chert and siltstone fragments; very strongly acid.

Thickness of the solum ranges from 60 to 72 inches or more. The soil is strongly acid or very strongly acid throughout.

The A horizon ranges from 6 to 20 inches in thickness. The A horizon has hue of 10YR, value of 4, 5, or 6, and chroma of 2, 3, or 4. Chert and siltstone fragments make up 35 to 50 percent of the volume.

The B1 horizon, where present, has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6.

The B2t horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 4 or 6. In some places the lower part has mottles. The B2t horizon is very cherty silt loam, very cherty silty clay loam, or very cherty silty clay. Chert and siltstone fragments make up 35 to 80 percent of the volume.

Crowley series

The Crowley series consists of deep, somewhat poorly drained, very slowly permeable, level soils on broad flats on terraces. These soils formed in loamy material underlain by clayey alluvium. The native vegetation was mixed hardwood trees. Slopes are 0 to 1 percent.

Crowley soils are geographically associated with Amagon and Jackport soils. Amagon soils are on natural levees at a lower elevation than the Crowley soils. They have a fine-silty control section and do not have abrupt texture changes. Jackport soils are on terraces at a lower elevation, have a very-fine control section, and do not have an abrupt texture change between the A and B horizons.

Typical pedon of Crowley silt loam, 0 to 1 percent slopes, in a moist cultivated field in the NW1/4NW1/4SW1/4 sec. 9, T. 11 N., R. 4 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; weak medium granular structure; very friable; common fine roots; medium acid; abrupt wavy boundary.

A2g—6 to 20 inches; gray (10YR 6/1) silt loam; common medium distinct grayish brown (10YR 5/2), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; strongly acid; abrupt wavy boundary.

B21tg—20 to 24 inches; grayish brown (10YR 5/2) silty clay; common medium distinct yellowish brown (10YR 5/6) and few fine prominent yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; firm; distinct continuous clay films; few silt coatings on peds and streaks of gray silt loam; few black concretions; strongly acid; gradual wavy boundary.

B22tg—24 to 30 inches; grayish brown (10YR 5/2) silty clay; common medium prominent yellowish brown (10YR 5/6) and red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; firm; distinct continuous clay films; few dark concretions; strongly acid; gradual wavy boundary.

B23tg—30 to 36 inches; grayish brown (10YR 5/2) silty clay; few fine distinct yellowish brown (10YR 5/6) and many medium prominent yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; firm; distinct continuous clay films on faces of peds; few dark concretions; strongly acid; gradual wavy boundary.

B24tg—36 to 40 inches; grayish brown (10YR 5/2) silty clay; few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; distinct continuous clay films on faces of peds; few fine dark concretions; medium acid; gradual wavy boundary.

B3g—40 to 52 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; few dark concretions; mildly alkaline; gradual wavy boundary.

Cg—52 to 72 inches; mottled light brownish gray (10YR 6/2), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/6) silty clay loam; weak medium subangular blocky structure parting to massive; friable; few dark concretions; mildly alkaline.

Thickness of the solum ranges from 48 to 60 inches. The A and B2t horizons are slightly acid to very strongly acid, and the B3 and C horizons are mildly alkaline to medium acid.

The A horizon ranges from 12 to 25 inches in thickness. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. The A2g horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or value of 5 and chroma of 2. Mottles are in shades of brown.

The B2tg and B3g horizons have hue of 10YR, value of 5 or 6, and chroma of 1 or 2. They are silty clay loam or silty clay. Mottles are in shades of brown, yellow, and red.

The Cg horizon is similar in color to the B3 horizon. Mottles are in shades of brown, yellow, or red. The Cg horizon is silty clay loam or silty clay.

Dubbs series

The Dubbs series consists of deep, well drained, moderately permeable, gently undulating soils on natural levees or terraces bordering former channels on bottom lands of the White and Black Rivers. The soils formed mainly in loamy alluvium. The native vegetation was mixed hardwood trees. Slopes are 0 to 3 percent.

Dubbs soils are geographically associated with Amagon, Askew, and Forestdale soils. Amagon soils are on natural levees at a lower elevation than the Dubbs soils and are poorly drained. Askew soils are also on natural levees at a lower elevation; they are moderately well drained. Forestdale soils are in depressions at a lower elevation, have a fine control section, and are poorly drained.

Typical pedon of Dubbs silt loam, gently undulating, in a moist cultivated field in the NE1/4SE1/4SW1/4 sec. 15, T. 11 N., R. 4 W.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak medium granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

B21t—6 to 25 inches; dark brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; continuous distinct dark yellowish brown clay films on faces of peds; few fine black concretions; medium acid; clear wavy boundary.

B22t—25 to 50 inches; dark brown (7.5YR 4/4) silty clay loam; common medium distinct yellowish brown (10YR 5/4) and pale brown (10YR 6/3) mottles; moderate fine and medium subangular blocky structure; friable few fine roots; many fine pores; continuous distinct dark yellowish brown clay films on faces of peds; few black concretions; medium acid; clear wavy boundary.

B3—50 to 60 inches; dark brown (10YR 4/4) loam; common medium distinct yellowish brown (10YR 5/4) and gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable; few fine black concretions; medium acid; clear wavy boundary.

C—60 to 72 inches; yellowish brown (10YR 5/6) loam; common medium distinct dark brown (7.5YR 4/4) and common fine distinct pale brown (10YR 6/3) and gray (10YR 6/1) mottles; very friable; few black concretions; medium acid.

The solum is 20 to 55 inches thick. Reaction is medium acid to very strongly acid throughout.

The A horizon is 5 to 12 inches thick. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The B2t and B3 horizons have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3, 4, or 6. In the lower part of the B2t horizon, mottles are none to common and are in shades of brown or gray. The B horizon is silt loam, loam, or silty clay loam.

The C horizon has hue of 10YR, value of 4 or 5, and chroma of 4 or 6. Mottles are in shades of brown or gray. The C horizon is silt loam, loam, or very fine sandy loam.

Egam series

The Egam series consists of deep, moderately well drained, moderately slowly permeable, level to nearly level soils on flood plains of the White River. The soils formed in loamy and clayey alluvium. The native vegetation was mixed hardwood trees. Slopes are 0 to 2 percent.

Egam soils are geographically associated with Arrington and Hontas soils. Arrington soils are on natural levees, are well drained, and have a fine-silty control section. Hontas soils are on flood plains along streams

at a lower elevation, have a fine-silty control section, and do not have a mollic epipedon.

Typical pedon of Egam silt loam, 0 to 1 percent slopes, in a cultivated area in the NE1/4NE1/4SE1/4 sec. 1, T. 11 N., R. 4 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; friable; neutral; clear smooth boundary.

A12—7 to 27 inches; very dark grayish brown (10YR 3/2) silty clay loam; few fine distinct yellowish brown mottles; weak medium subangular blocky structure; firm; neutral; gradual smooth boundary.

B21—27 to 37 inches; very dark grayish brown (10YR 3/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; neutral; gradual smooth boundary.

B22—37 to 43 inches; very dark grayish brown (10YR 3/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; neutral; gradual smooth boundary.

B23—43 to 47 inches; dark brown (10YR 4/3) silty clay loam; common medium distinct dark grayish brown (10YR 4/2), strong brown (7.5YR 4/6), and yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few black concretions; slightly acid; gradual smooth boundary.

B24—47 to 58 inches; dark brown (10YR 4/3) silty clay loam; few fine faint dark yellowish brown (10YR 4/6) and common medium distinct dark grayish brown (10YR 4/2) mottles; moderate medium subangular blocky structure; few black concretions; firm; slightly acid; clear smooth boundary.

B3—58 to 72 inches; dark brown (10YR 4/3) silty clay loam; common medium distinct yellowish brown (10YR 5/8) and strong brown (7.5YR 4/6) mottles and few medium distinct grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; firm; few black concretions; slightly acid.

The solum is 50 to 72 inches thick. The mollic epipedon is 24 to 55 inches thick. The A horizon and upper part of the B2 horizon are neutral to medium acid, and the lower part of the B2 horizon and the B3 horizon are moderately alkaline to medium acid.

The A horizon is 24 to 27 inches thick. The Ap and A12 horizons have hue of 10YR, value of 3, and chroma of 2 or 3. The A horizon is silt loam or silty clay loam.

The B21 and B22 horizons have hue of 10YR, value of 3, and chroma of 2 or 3. Mottles are few to common and are in shades of brown and yellow. The B23 and B24 horizons have hue of 10YR or 7.5YR, value of 5, and chroma of 4 or 6, or they have hue of 10YR, value of 4, and chroma of 3 or 4. Mottles are common to many and are in shades of gray and brown. The B2 horizons are silty clay loam or silty clay.

The B3, or the C horizon where present, is similar in color and texture to the lower part of the B2 horizon.

Enders series

The Enders series consists of deep, well drained, very slowly permeable, gently sloping to very steep soils in the Boston Mountains. These soils are on ridgetops and side slopes on dissected plateaus and mountains. They formed in thin layers of loamy colluvial material and clayey residuum of shale or interbedded shale and sandstone. The native vegetation was mixed hardwoods and pine. Slopes are 3 to 45 percent.

Enders soils are geographically associated with Linker, Mountainburg, and Sidon soils. Linker soils are on similar landscapes, have a fine-loamy control section, and are moderately deep. Mountainburg soils are on ridgetops and benches, have a loamy-skeletal control section, and are shallow to bedrock. Sidon soils are on adjacent undulating plateaus and benches at a higher elevation. They have a fine-loamy control section and a fragipan.

Typical pedon of Enders stony fine sandy loam, 8 to 20 percent slopes, in a moist wooded area in the NE1/4SW1/4SE1/4 sec. 36, T. 14 N., R. 6 W.

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) stony fine sandy loam; weak medium granular structure; friable; about 25 percent, by volume, angular sandstone fragments 1/2 inch to 12 inches in diameter; common medium and fine roots; common fine pores; strongly acid; clear smooth boundary.

A12—2 to 10 inches; brown (10YR 5/3) stony fine sandy loam; weak medium subangular blocky structure; friable; about 30 percent, by volume, angular sandstone fragments from 1/2 inch to 12 inches in diameter; common medium and fine roots; common fine pores; very strongly acid; clear smooth boundary.

B21t—10 to 24 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; very firm; continuous distinct clay films on faces of peds; many fine and medium roots; few fragments of shale and sandstone; extremely acid; clear wavy boundary.

B22t—24 to 44 inches; red (2.5YR 4/6) clay; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; very firm, plastic; continuous distinct clay films on faces of peds; few fine roots; extremely acid; clear wavy boundary.

B3—44 to 58 inches; mottled red (2.5YR 4/6), gray (10YR 6/1), and brown (10YR 4/3) clay; strong angular blocky structure; very firm; about 5 percent, by volume, shale fragments; extremely acid; abrupt smooth boundary.
Cr—58 to 60 inches; partly weathered level-bedded shale and siltstone bedrock.

The thickness of the solum and the depth to soft bedrock range from 40 to 60 inches. The soil is strongly acid to extremely acid throughout.

The A horizon ranges from 3 to 10 inches in thickness. The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A12 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Sandstone and shale fragments make up 0 to 35 percent of the volume.

The B1 horizon, where present, has hue of 7.5YR or 5YR, value of 5, and chroma of 4, 6, or 8. It is silt loam or loam. The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. Mottles are in shades of gray and brown. The lower part of the B2t horizon is commonly mottled in shades of brown, red, and gray. The B2t horizon is silty clay loam, silty clay, or clay. The B3 horizon is similar in color to the lower part of the B2t horizon.

The Cr horizon is extremely acid, partly weathered, level-bedded shale and siltstone grading to hard shale.

Foley series

The Foley series consists of deep, poorly drained, very slowly permeable, level soils on terraces and broad flats. These soils formed in loamy sediment of loesslike material. They are saturated with water from late in winter to early in spring. The native vegetation was mixed hardwoods. Slopes are 0 to 1 percent.

Foley soils are geographically associated with Amagon and Crowley soils. Amagon soils are on natural levees at a lower elevation than the Foley soils. They do not have a natric horizon or glossic properties. Crowley soils are on terraces at a slightly higher elevation; they have a fine control section and an abrupt change in texture between the A horizon and the B horizon.

Typical pedon of Foley silt loam, 0 to 1 percent slopes, in a moist cultivated area in the SW1/4SE1/4NW1/4 sec. 15, T. 12 N., R. 4 W.

Ap—0 to 7 inches; brown (10YR 5/3) silt loam; weak medium granular structure; very friable; few fine roots; few fine dark concretions; medium acid; abrupt smooth boundary.
A2—7 to 11 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium granular and weak medium subangular blocky structure; friable; few fine roots; medium acid; abrupt wavy boundary.
B21tg—11 to 23 inches; grayish brown (10YR 5/2) silty clay loam; many medium distinct dark yellowish brown (10YR 4/4), brown (10YR 5/3), and light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; firm; few patchy clay films on faces of peds; few fine roots; 1/2-inch-wide gray silt tongues throughout; few fine dark concretions; strongly acid; clear wavy boundary.
B22tg—23 to 34 inches; dark grayish brown (10YR 4/2) silty clay loam; common medium distinct dark yellowish brown (10YR 4/4) 4/4) and yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to moderate coarse angular blocky; firm; few patchy clay films between peds; gray silt interfingering between peds; many fine dark concretions; neutral; clear wavy boundary.
B23tg—34 to 54 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct dark yellowish brown (10YR 4/4) and light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to moderate coarse angular blocky; firm; few patchy clay films on faces of peds; gray silt interfingering between peds; common fine dark concretions; mildly alkaline; clear wavy boundary.
B3—54 to 72 inches; pale brown (10YR 6/3) silt loam; few medium distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) mottles; weak coarse angular blocky structure; firm; common fine dark concretions; common black veins and stains; moderately alkaline.

The solum is 40 to 72 inches thick. The A horizon is neutral to very strongly acid. The upper part of the B horizon is neutral to strongly acid, and the lower part of the B horizon and the C horizon are strongly alkaline to neutral.

The A horizon is about 4 to 15 inches thick. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

The Bt horizon has hue of 10YR or 2.5Y, value of 4, 5, or 6, and chroma of 1 or 2. Mottles are in shades of brown and gray. The Bt horizon is silt loam or silty clay loam. The B3 horizon has hue of 10YR, value of 5 or 6, and chroma of 3, or it has the same colors as the B2 horizon. Mottles are in shades of brown. The B3 horizon is silt loam or silty clay loam.

Forestdale series

The Forestdale series consists of deep, poorly drained, very slowly permeable, level soils on the lower part of natural levees along the Black and White Rivers. The soils formed in clayey and loamy sediment. They are frequently flooded and are saturated with water from late in winter to early in spring. The native vegetation was mixed hardwood trees. Slopes are 0 to 1 percent.

Forestdale soils are geographically associated with Amagon, Askew, and Dubbs soils. Amagon soils are on a similar landscape and have a fine-silty control section. Askew soils are on natural levees at a higher elevation, are moderately well drained, and have a fine-silty control section. Dubbs soils are also on natural levees or terraces at a higher elevation; they are well drained and have a fine-silty control section.

Typical pedon of Forestdale silt loam, frequently flooded, in a cultivated area in the NE1/4SW1/4SW1/4 sec. 18, T. 14 N., R. 2 W.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak medium granular structure; friable; few fine roots; strongly acid; abrupt smooth boundary.

B21tg—4 to 15 inches; light brownish gray (10YR 6/2) silty clay; common medium distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common patchy clay films on faces of peds; few fine roots; strongly acid; clear smooth boundary.

B22tg—15 to 24 inches; gray (10YR 5/1) silty clay; many medium distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm, plastic; continuous clay films on faces of peds; veins and pockets of dark gray (10YR 4/1); strongly acid; clear wavy boundary.

B23tg—24 to 42 inches; gray (10YR 5/1) silty clay; many medium faint dark gray (10YR 4/1) and distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm, plastic; continuous clay films on faces of peds; common medium dark concretions; strongly acid; clear wavy boundary.

B24tg—42 to 56 inches; gray (10YR 5/1) silty clay; common medium distinct dark brown (10YR 3/4), dark yellowish brown (10YR 4/4), and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; veins and pockets of dark gray (10YR 4/1); firm; continuous clay films on faces of peds; common medium dark concretions; medium acid; clear wavy boundary.

B3g—56 to 70 inches; gray (10YR 5/1) silty clay loam; common medium distinct dark yellowish brown (10YR 4/4), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/6) mottles; massive to moderate medium subangular blocky structure; veins and pockets of dark gray (10YR 4/1); firm; many patchy clay films on faces of peds; neutral; clear wavy boundary.

Cg—70 to 80 inches; light brownish gray (10YR 6/2) silty clay loam; common medium yellowish brown (10YR 5/6 and 5/8) and few medium distinct strong brown (7.5YR 5/6) mottles; massive; friable; neutral.

The thickness of the solum ranges from 40 to 72 inches or more. The A and B2t horizons are medium acid to very strongly acid, and the B3 and C horizons are mildly alkaline to strongly acid.

The A horizon is 4 to 10 inches thick. The A horizon has hue of 10YR, value of 4, and chroma of 1 or 2.

The B2tg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2, or it has hue of 2.5Y, value of 6, and chroma of 2. Mottles are in shades of brown. The B2tg horizon is silty clay loam or silty clay. The B3g horizon is similar in color to the B2tg horizon. It is silt loam or silty clay loam.

The Cg horizon, where present, is similar in color and texture to the B3g horizon.

Gepp series

Gepp series consist of deep, well drained, moderately permeable, gently sloping to steep soils on ridgetops and side slopes in the Ozark Highlands. These soils formed in clayey residuum of cherty limestone bedrock. The native vegetation consisted of oak and hickory and some shortleaf pine. Slopes are 3 to 30 percent.

Gepp soils are geographically associated with Arkana, Clarksville, Moko, and Noark soils. Arkana soils are on a similar landscape but at a lower elevation than the Gepp soils. They are moderately deep and have a mollic-colored surface layer. Clarksville soils are on hilltops and side slopes at a higher elevation, have a loamy-skeletal control section, and are somewhat excessively drained. Moko soils are on adjacent benches and foot slopes, are shallow, and have a loamy-skeletal control section. Noark soils are on hilltops and side slopes at a higher elevation; they have a clayey-skeletal control section.

Typical pedon of Gepp very cherty silt loam, 8 to 12 percent slopes, in a moist wooded area in the NW1/4NE1/4SE1/4 sec. 25, T. 14 N., R. 6 W.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) very cherty silt loam; weak medium granular structure; friable; many fine roots; about 40 percent, by volume, chert fragments 1/2 inch to 8 inches in diameter; strongly acid; abrupt smooth boundary.

A2—4 to 12 inches; yellowish brown (10YR 5/4) very cherty silt loam; weak medium granular and subangular blocky structure; friable; common fine roots; about 35 percent, by volume, chert fragments 1/2 inch to 6 inches in diameter; strongly acid; clear smooth boundary.

B1—12 to 23 inches; red (2.5YR 5/6) silty clay; moderate fine and medium subangular blocky structure; firm; common fine roots and pores; strongly acid; gradual smooth boundary.

B21t—23 to 36 inches; red (2.5YR 4/6) clay; few medium distinct yellowish red (5YR 5/6) mottles; moderate medium blocky and subangular blocky structure; few fine roots and pores; continuous clay films on faces of peds and in pores; strongly acid; gradual irregular boundary.

B22t—36 to 48 inches; red (2.5YR 4/6) clay; common medium distinct strong brown (7.5YR 5/6) and few fine prominent gray mottles; moderate medium blocky and subangular blocky structure; firm, slightly plastic; few fine roots and pores; common thin clay films between peds; about 5 percent, by volume, chert and siltstone fragments 1/2 inch to 8 inches in diameter; strongly acid; abrupt smooth boundary.

B23t—48 to 65 inches; red (2.5YR 4/6) clay; many medium distinct strong brown (7.5YR 5/6) and gray (10YR 5/1) mottles; moderate fine and medium blocky and subangular blocky structure; firm, slightly plastic; few fine roots; few thin clay films between peds; about 5 percent, by volume, chert and siltstone fragments 1/2 inch to 8 inches in diameter; strongly acid; abrupt irregular boundary.

R—65 inches; cherty limestone bedrock; cracks filled with red clay.

The thickness of the solum ranges from 60 to 72 inches or more. The A horizon is slightly acid to strongly acid. The upper part of the B horizon is medium acid to very strongly acid, and the lower part of the B horizon is medium acid or strongly acid.

The A horizon ranges from 7 to 12 inches in thickness. The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Where the horizon has mollic colors it is less than 5 inches thick. The A2 horizon has hue of 10YR, value of 4, 5, or 6, and chroma of 2, 3, or 4. Chert fragments make up 35 to 50 percent of the volume.

The B1 horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6. The B2t horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6, or it has hue of 2.5YR, value of 4, and chroma of 8. Mottles are in shades of red and brown. In the lower part of the B2t horizon mottles are gray and range from none to common. The B2t horizon is clay or the cherty analog. Chert fragments make up 0 to 20 percent of the volume.

Hontas series

The Hontas series consists of deep, moderately well drained, moderately permeable, level soils on flood plains along streams that drain the Ozark Highlands. These soils formed in alluvium washed from soils that formed in limestone and siltstone. The native vegetation was mixed hardwood trees. Slopes are 0 to 1 percent.

Hontas soils are geographically associated with Arrington and Egam soils. Arrington soils are at a slightly higher elevation than the Hontas soils, are well drained, and have a mollic epipedon. Egam soils are on wide flood plains at a slightly higher elevation, have a mollic epipedon, and a fine control section.

Typical pedon of Hontas silt loam, occasionally flooded, in a moist pasture in the NW1/4NE1/4NW1/4 sec. 18, T. 12 N., R. 5 W.

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam; weak medium granular structure; friable; few fine roots; few fine dark concretions; slightly acid; clear smooth boundary.

A12—5 to 12 inches; dark brown (10YR 4/3) silt loam; weak medium granular structure; friable; few fine roots; few dark fine concretions; few wormholes and wormcasts; slightly acid; clear wavy boundary.

B21—12 to 22 inches; brown (10YR 5/3) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; common fine pores; few black concretions; medium acid; gradual wavy boundary.

B22—22 to 39 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; firm; common fine pores; common dark concretions; few black stains; medium acid; clear wavy boundary.

C1g—39 to 60 inches; gray (10YR 6/1) silty clay loam; common medium distinct brown (10YR 5/3) and dark yellowish brown (10YR 4/4) mottles; massive; firm; common fine pores; many fine and medium black concretions; few black stains; medium acid; clear wavy boundary.

C2g—60 to 72 inches; gray (10YR 6/1) silty clay loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; massive; firm; many fine and medium black concretions; few dark stains; slightly acid.

Thickness of the solum ranges from 30 to 50 inches. The A horizon is neutral to medium acid, and the B and Cg horizons are mildly alkaline to medium acid.

The A horizon ranges from 6 to 14 inches in thickness. The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4.

The B21 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Mottles are few to common and are in shades of brown or gray. The B22 horizon has hue of 10YR, value of 4 or 5, and chroma of 2, 3, or 4. Mottles are in shades of brown or gray. The B horizon is silt loam or silty clay loam.

The C horizon has hue of 10YR, value of 4, 5, or 6, and chroma of 1 or 2. It has mottles in shades of brown, or it is evenly mottled in shades of gray and brown. It is silt loam or silty clay loam.

Jackport series

The Jackport series consists of deep, poorly drained, very slowly permeable, level soils on terraces that are backswamps of former streams. These soils formed in beds of predominantly clayey sediment. They have a perched water table late in winter and early in spring. The native vegetation was mixed hardwood trees. Slopes are 0 to 1 percent.

Jackport soils are geographically associated with Amagon, Crowley, and Forestdale soils. Amagon soils are on natural levees at a lower elevation than the Jackport soils. They have a fine-silty control section and do not have vertic properties. Crowley soils are on terraces at a slightly higher elevation and have a fine control section and an abrupt change in texture between the A and B horizons. Forestdale soils are on a similar landscape at a slightly lower elevation and have a fine control section.

Typical pedon of Jackport silty clay loam, 0 to 1 percent slopes, in a ricefield in the NE1/4NE1/4SE1/4 sec. 25, T. 11 N., R. 4 W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silty clay loam; few fine distinct yellowish brown mottles; moderate medium granular structure; friable, plastic; many fine roots; medium acid; clear smooth boundary.

A2g—5 to 12 inches; gray (10YR 6/1) silty clay loam; common medium distinct dark yellowish brown (10YR 4/6) mottles; weak medium subangular blocky structure; firm, plastic; common fine roots; slightly acid; clear wavy boundary.

B21tg—12 to 26 inches; grayish brown (2.5Y 5/2) clay; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm, very plastic; few fine roots; few fine dark concretions; few slickensides; shiny faces on peds; strongly acid; gradual smooth boundary.

B22tg—26 to 38 inches; dark grayish brown (2.5Y 4/2) clay; common medium distinct yellowish brown (10YR 5/6) mottles; strong medium subangular blocky structure; firm, plastic; few fine roots; few fine dark concretions; few slickensides; shiny faces on peds; strongly acid; gradual wavy boundary.

B23tg—38 to 54 inches; grayish brown (2.5Y 5/2) clay; few fine distinct yellowish brown mottles; strong medium subangular blocky structure; firm, plastic; few fine roots; few fine dark concretions; shiny faces on peds; strongly acid; clear wavy boundary.

B3g—54 to 72 inches; grayish brown (2.5Y 5/2) silty clay; few fine distinct yellowish brown mottles; moderate medium subangular blocky structure; firm, plastic; few fine dark concretions; strongly acid.

The solum is 30 to 60 inches thick. The A horizon is medium acid to very strongly acid. The B horizon is very strongly acid or strongly acid, and the C horizon is neutral to strongly acid.

The A horizon is 4 to 12 inches thick. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2. The A2 horizon has hue of 10YR, value of 5, and chroma of 1 or value of 6 and chroma of 2. In some places there is no A2 horizon.

The B2tg horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2. It is clay or silty clay.

The B3g horizon and the Cg horizon, where present, have hue of 10YR, 2.5Y, or 5Y, value of 4 or 5, and chroma of 2. They are clay, silty clay, or silty clay loam.

Lily series

The Lily series consists of moderately deep, well drained, moderately rapidly permeable, gently sloping to steep soils on upland ridges and side slopes in the Ozark Highlands. These soils formed in residuum of acid sandstone. The native vegetation was mixed hardwood trees. Slopes are 3 to 30 percent.

Lily soils are geographically associated with Boden, Brockwell, Portia, and Ramsey soils. Boden soils are on adjacent similar landscapes, have a clayey control section, and are deep to bedrock. Brockwell soils are on adjacent similar landscapes at a lower elevation, have a coarse-loamy control section, and are deep to bedrock. Portia soils are on adjacent similar landscapes and are deep to bedrock. Ramsey soils are also on adjacent similar landscapes and are shallow to bedrock.

Typical pedon of Lily fine sandy loam, 3 to 8 percent slopes, in a moist wooded area in the NE1/4SW1/4SW1/4 sec. 20, T. 15 N., R. 5 W.

A1—0 to 4 inches; brown (10YR 4/3) fine sandy loam; weak medium granular structure; friable; many fine roots; about 5 percent, by volume, sandstone fragments; strongly acid; abrupt smooth boundary.

B1—4 to 11 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; many fine and medium roots; about 5 percent, by volume, sandstone fragments; strongly acid; clear smooth boundary.

B21t—11 to 16 inches; strong brown (7.5YR 5/6) loam; weak medium subangular blocky structure; friable; many fine and medium roots; about 5 percent, by volume, sandstone fragments; common patchy clay films on faces of peds; strongly acid; clear smooth boundary.

B22t—16 to 23 inches; yellowish red (5YR 5/8) loam; veins of brownish yellow (10YR 6/6); moderate medium subangular blocky structure; friable; common medium and fine roots; about 5 percent, by volume, sandstone fragments; many patchy clay films on faces of peds; strongly acid; clear smooth boundary.

B23t—23 to 38 inches; strong brown (7.5YR 5/8) sandy clay loam; common medium distinct yellowish brown (10YR 5/4) and yellowish red (5YR 4/8) mottles; moderate medium subangular blocky structure; friable; few medium roots; about 5 percent, by volume, sandstone fragments; many patchy clay films on faces of peds; very strongly acid; abrupt smooth boundary.
R—38 inches; level-bedded acid sandstone.

Thickness of the solum and depth to bedrock range from 20 to 40 inches. The soil is strongly acid to extremely acid throughout.

The A horizon is 4 to 8 inches thick. The A1 horizon has hue of 10YR, value of 3, 4, or 5, and chroma of 2 or 3. The Ap and A2 horizons have hue of 10YR, value of 4, 5, or 6, and chroma of 2, 3, or 4. Coarse sandstone fragments make up 0 to 10 percent of the volume.

The B1 horizon, where present, has hue of 10YR or 7.5YR, value of 5, and chroma of 4 or 6. It is fine sandy loam or loam. Coarse fragments make up 0 to 10 percent of the volume.

The B2t horizon has hue of 10YR, 7.5YR, or 5YR, value of 4, 5, or 6, and chroma of 4, 6, or 8. Mottles are in shades of red, brown, or yellow. The B2t horizon is loam, sandy clay loam, or clay loam.

The B3 horizon, or the C horizon where present, has hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 6 or 8. The texture is sandy loam, fine sandy loam, or sandy clay loam. Mottles are in shades of red, brown, yellow, and gray.

Linker series

The Linker series consists of moderately deep, well drained, moderately permeable, gently sloping to steep soils on side slopes, ridgetops, and plateaus of the Boston Mountains. These soils formed in loamy residuum of sandstone. The native vegetation was hardwood trees. Slopes are 3 to 30 percent.

Linker soils are geographically associated with Enders, Mountainburg, and Sidon soils. These soils are on a landscape similar to that of the Linker soils. Enders soils have a clayey control section and are deep. Mountainburg soils have a loamy-skeletal control section and are shallow. Sidon soils have a fragipan and are deep.

Typical pedon of Linker fine sandy loam, 8 to 12 percent slopes, in a wooded area in the NW1/4SE1/4SW1/4 sec. 29, T. 11 N., R. 5 W.

A1—0 to 5 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; common fine and medium pores; about 10 percent, by volume, sandstone fragments; few wormcasts; strongly acid; clear wavy boundary.
B1—5 to 9 inches; strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; many fine and medium pores; few wormcasts; about 10 percent, by volume, sandstone fragments; very strongly acid; clear wavy boundary.
B2t—9 to 24 inches; yellowish red (5YR 4/6) loam; weak medium subangular blocky structure; friable; few fine and medium roots; many fine pores; few continuous distinct clay films on faces of peds; clay coatings and bridgings on sand grains; about 10 percent, by volume, sandstone fragments; very strongly acid; clear wavy boundary.
B3—24 to 30 inches; yellowish red (5YR 4/6) gravelly sandy clay loam; common medium distinct red (2.5YR 4/6), strong brown (7.5YR 5/6), and gray (10YR 6/1) mottles; weak medium granular structure; friable; common fine pores; about 25 percent, by volume, sandstone fragments; very strongly acid; abrupt smooth boundary.
R—30 to 32 inches; hard massive level-bedded acid sandstone.

Thickness of the solum and depth to bedrock range from 20 to 40 inches. The soil is strongly acid to very strongly acid throughout.

The A horizon is 4 to 10 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 2 or 3 or value of 5 and chroma of 3 or 4. Where the value is 3 the horizon is less than 6 inches thick. The A horizon is fine sandy loam or gravelly fine sandy loam.

The B1 horizon has hue of 5YR, value of 4 or 5, and chroma of 6, or it has hue of 7.5YR, value of 5, and chroma of 6. The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8. It is sandy clay loam, clay loam, or loam. Sandstone fragments range from 0 to 10 percent, by volume. The B3 horizon, where present, is similar in color and texture to the B2 horizon and has red, brown, and gray mottles. Sandstone fragments range from 0 to 25 percent, by volume.

In some places there is a Cr horizon of weathered sandstone in various shades of red, brown, and gray.

Loring series

The Loring series consists of deep, moderately well drained, moderately slowly permeable, nearly level to moderately sloping soils on uplands and terraces adjacent to bottom lands. These soils formed in loess more than 4 feet thick. The native vegetation was hardwood trees. Slopes are 1 to 12 percent.

Loring soils are geographically associated with Saffell soils. Saffell soils are on uplands on coastal plains; they have a loamy-skeletal control section and do not have a fragipan.

Typical pedon of Loring silt loam, 3 to 8 percent slopes, in a moist pasture in the SW1/4NE1/4SE1/4 sec. 16, T. 14 N., R. 3 W.

Ap—0 to 4 inches; brown (10YR 4/3) silt loam; weak medium granular structure; friable; common fine roots; few fine pores; strongly acid; clear smooth boundary.

B21t—4 to 13 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; continuous thin clay films on faces of peds; common fine roots; few fine pores; few krotovinas; few medium black stains; strongly acid; clear smooth boundary.

B22t—13 to 19 inches; strong brown (7.5YR 5/6) silty clay loam; common medium faint yellowish brown (10YR 5/8) coatings; moderate medium subangular blocky structure; firm; continuous distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

B23t—19 to 25 inches; strong brown (7.5YR 5/6) silt loam; yellowish brown (10YR 5/4) silt coatings on some peds; moderate coarse subangular blocky structure parting to weak medium angular blocky; firm; continuous distinct clay films on faces of peds; vertical veins of gray (10YR 6/1) silty clay loam; very strongly acid; gradual wavy boundary.

Bx1—25 to 36 inches; brown (7.5YR 4/4) silty clay loam; few medium distinct yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; about 70 percent, by volume, hard, compact and brittle; continuous thick clay films on faces of peds within prisms; few fine pores; very strongly acid; gradual wavy boundary.

Bx2—36 to 52 inches; brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; about 75 percent, by volume, hard, compact and brittle; vertical and horizontal veins of gray silt about 1/2 inch wide between some peds; continuous distinct clay films on faces of peds; few fine pores; very strongly acid; gradual wavy boundary.

Bx3—52 to 72 inches; brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure; about 75 percent, by volume, hard, compact and brittle; vertical and horizontal veins of gray silt loam about 1/2 inch wide at 4- to 8-inch intervals; few fine pores; very strongly acid.

The thickness of the solum ranges from 45 to 72 inches or more. Depth to the fragipan ranges from 22 to 35 inches. The soil is medium acid to very strongly acid throughout.

The A horizon is 6 to 9 inches thick. It has hue of 10YR, value of 4, and chroma of 3 or value of 5 and chroma of 4.

The B2t horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or value of 5 and chroma of 6. It is silt loam or silty clay loam.

The Bx horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or value of 5 and chroma of 6. Mottles are in shades of yellow, brown, and gray. The Bx horizon is silt loam or silty clay loam.

Moko series

The Moko series consists of shallow, well drained, moderately permeable, gently sloping to moderately steep soils on benches and ridgetops in the Ozark Highlands. These soils formed in loamy residuum of limestone. The native vegetation was eastern redcedar and native grasses and sparse populations of post oak, chestnut oak, ash, and elm. Slopes are 3 to 20 percent.

Moko soils are geographically associated with Arkana, Gepp, and Newnata soils. Arkana soils are on adjacent similar landscapes, have a very-fine control section, and are moderately deep to bedrock. Gepp soils are on adjacent side slopes and ridgetops at a higher elevation, have a very-fine control section, and are deep to limestone bedrock. Newnata soils are on side slopes at a lower elevation, are deep to bedrock, and have a fine control section.

Typical pedon of Moko very stony silt loam, in an area of Arkana-Moko complex, 3 to 8 percent slopes, in a moist wooded area in the NE1/4NE1/4NW1/4 sec. 3, T. 14 N., R. 5 W.

A11—0 to 3 inches; very dark gray (10YR 3/1) very stony silt loam; weak medium granular structure; friable; many fine roots; about 10 percent, by volume, chert fragments; about 50 percent limestone fragments 3 to 12 inches in diameter; mildly alkaline; clear smooth boundary.

A12—3 to 10 inches; very dark grayish brown (10YR 3/2) very stony silty clay loam; moderate medium subangular blocky structure; friable; common and medium roots; about 20 percent, by volume, chert fragments; 60 percent limestone fragments 3 to 14 inches in diameter; mildly alkaline; abrupt smooth boundary.

R—10 inches; gray hard fractured limestone.

Thickness of the solum and depth to bedrock range from 6 to 20 inches. The soil is neutral or mildly alkaline throughout.

The A horizon ranges from 6 to 20 inches in thickness. It has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. In some places there are very faint dark grayish brown mottles. The A horizon is very stony silty clay loam, very stony silt loam, or very stony loam. Chert fragments make up 10 to 25 percent of the volume. Limestone fragments more than 3 inches in diameter make up 25 to 60 percent of the volume.

Mountainburg series

The Mountainburg series consists of shallow, well drained, moderately rapidly permeable, gently sloping to moderately sloping soils on plateaus, ridgetops, and side slopes in the Boston Mountains. These soils formed in hard, massive, horizontally bedded sandstone interbedded with shale. The native vegetation was mixed hardwoods and pine. Slopes are 3 to 12 percent.

Mountainburg soils are geographically associated with Enders, Linker, and Sidon soils. Enders soils are on adjacent side slopes, have a clayey control section, and are deep to bedrock. Linker soils are on a similar landscape, have a fine-loamy control section, and are moderately deep to bedrock. Sidon soils are on side slopes, undulating plateaus, and benches; they have a fragipan and are deep to bedrock.

Typical pedon of Mountainburg stony fine sandy loam, 3 to 12 percent slopes, in a moist pasture in the NW1/4SW1/4SW1/4 sec. 35, T. 11 N., R. 5 W.

Ap—0 to 5 inches; dark brown (10YR 4/3) stony fine sandy loam; weak medium granular structure; very friable; many fine roots; about 35 percent, by volume, sandstone fragments 1/8 inch to 14 inches in diameter; very strongly acid; abrupt smooth boundary.

B21t—5 to 12 inches; strong brown (7.5YR 5/6) very gravelly sandy clay loam; weak medium subangular blocky structure; friable; common fine and medium roots; few patchy clay films on faces of peds; about 40 percent, by volume, sandstone fragments 1/4 inch to 14 inches in diameter; very strongly acid; clear irregular boundary.

B22t—12 to 18 inches; strong brown (7.5YR 5/6) very gravelly sandy loam; common medium prominent red and yellow mottles; weak medium subangular blocky structure; friable; few patchy clay films on faces of peds; bridgings and coatings on sand grains; 50 percent, by volume, sandstone fragments 1/4 inch to 14 inches or more in diameter; very strongly acid; abrupt smooth boundary.

R—18 inches; hard horizontally bedded acid sandstone.

Thickness of the solum and depth to bedrock range from 12 to 20 inches. The soil is strongly acid to very strongly acid throughout.

The A horizon ranges from 4 to 8 inches in thickness. The A1 and Ap horizons have hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A2 horizon, where present, has hue of 10YR, value of 4 or 5, and chroma of 3 or 4, or it has hue of 10YR or 7.5YR, value of 5, and chroma of 6. The A horizon is 15 to 50 percent sandstone fragments.

The B horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6, or it has hue of 5YR, value of 4, and chroma of 8. It is 35 to 50 percent sandstone gravel and stones. The fine earth texture is sandy loam, loam, or sandy clay loam and gravelly or very gravelly modifiers.

Newnata series

The Newnata series consists of deep, well drained, slowly permeable, gently sloping to moderately sloping soils on side slopes. These soils formed in clayey residuum of limestone, shale, or siltstone. The native vegetation was hardwood trees. Slopes are 3 to 12 percent.

Newnata soils are geographically associated with Egam and Moko soils. Egam soils are on broad flats on adjacent flood plains; they have a mollic epipedon and are moderately well drained. Moko soils are on benches and ridgetops at a higher elevation; they have a loamy-skeletal control section and are shallow to bedrock.

Typical pedon of Newnata silty clay loam, 8 to 12 percent slopes, in a moist wooded area in the NW1/4SE1/4SW1/4 sec. 1, T. 11 N., R. 5 W.

Ap—0 to 4 inches; dark brown (10YR 4/3) silty clay loam; weak medium subangular blocky structure; firm; few fine and medium roots; few fine pores; about 10 percent, by volume, flat siltstone and shalelike fragments less than 1/8 inch in diameter; neutral; clear smooth boundary.

B21t—4 to 12 inches; strong brown (7.5YR 5/6) silty clay; weak medium subangular blocky structure; firm; continuous thick clay films on faces of peds; few fine roots; few fine pores; slightly acid; clear wavy boundary.

B22t—12 to 35 inches; strong brown (7.5YR 5/6) silty clay; common medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; very firm; continuous thick clay films on faces of peds; few fine pores; few fine dark concretions; few black stains; slightly acid; clear wavy boundary.

B23t—35 to 48 inches; yellowish brown (10YR 5/4) silty clay; few fine distinct grayish brown and pale brown mottles; moderate medium subangular blocky structure; very firm; continuous thick clay films on faces of peds; few fine calcium carbonate concretions in lower part; neutral; gradual wavy boundary.

Cr—48 to 52 inches; soft weathered black (10YR 2/1) and gray (10YR 5/1) shale; yellowish brown (10YR 5/4) clay in vertical fractures and seams; clear wavy boundary.

R—52 inches; hard calcareous shale bedrock.

Thickness of the solum and depth to bedrock range from 40 to 60 inches. The A horizon is medium acid to neutral, and the B horizon is medium acid to mildly alkaline.

The A horizon ranges from 3 to 8 inches in thickness. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The B1 horizon, where present, has hue of 10YR, value of 5, and chroma of 4 or 6. It is silty clay or silty clay loam. The B2t horizon has hue of 7.5YR or 10YR, value of 5, and chroma of 4 or 6. Mottles, where present, are in shades of yellow or brown. The B2t horizon is clay or silty clay. The B3 horizon, where present, is similar in color and texture to the B1 and B2t horizons.

The C horizon, where present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 or 6. Mottles are common to many and are in shades of brown or gray or variegated brown and gray. The C horizon is clay, silty clay, or silty clay loam.

Noark series

The Noark series consists of deep, well drained, moderately permeable, gently sloping to steep soils on side slopes and ridgetops in the Ozark Highlands. These soils formed in clayey residuum of cherty limestone. The native vegetation was hardwood trees. Slopes are 3 to 30 percent.

Noark soils are geographically associated with Arkana, Clarksville, and Gepp soils. Arkana soils are on a similar landscape but at a lower elevation than the Noark soils. They have a very-fine control section and are moderately deep to bedrock. Clarksville soils are on a similar landscape at a higher elevation. They have a loamy-skeletal control section and are somewhat excessively drained. Gepp soils are on a similar landscape at a lower elevation. They have a very-fine control section and have fewer coarse fragments in the argillic horizon.

Typical pedon of Noark very cherty silt loam, 12 to 30 percent slopes, in a moist pasture in the NE1/4NE1/4NW1/4 sec. 8, T. 13 N., R. 6 W.

Ap—0 to 4 inches; dark brown (10YR 4/3) very cherty silt loam; weak fine granular structure; very friable; many fine and medium roots; fine pores; few black organic stains; about 35 percent, by volume, coarse chert and siltstone fragments; strongly acid; clear smooth boundary.

A2—4 to 14 inches; brown (10YR 5/3) very cherty silt loam; weak medium granular structure; very friable; many fine and medium roots; few wormholes; few fine pores; few black organic stains; about 35 percent, by volume, coarse chert and siltstone fragments; very strongly acid; clear wavy boundary.

B1—14 to 24 inches; strong brown (7.5YR 5/6) very cherty silty clay loam; weak medium subangular blocky structure; firm; few fine roots; few fine pores; about 45 percent, by volume, coarse fragments of chert and siltstone; very strongly acid; clear wavy boundary.

B21t—24 to 34 inches; yellowish red (5YR 4/6) very cherty silty clay; moderate medium subangular blocky structure; firm; continuous distinct clay films on faces of peds; few fine roots; few fine pores; about 60 percent, by volume, chert and siltstone fragments; very strongly acid; gradual wavy boundary.

B22t—34 to 52 inches; dark red (2.5YR 3/6) very cherty clay; strong medium subangular blocky structure; firm; continuous distinct clay films on faces of peds; few decayed medium roots and old root channels; few black stains; about 70 percent, by volume, chert and siltstone fragments; soft gray and brown partly weathered bands or streaks of chert, siltstone, and limestone; very strongly acid; gradual wavy boundary.

B23t—52 to 72 inches; dark red (2.5YR 3/6) very cherty clay; strong medium subangular blocky structure; very firm; continuous distinct clay films on faces of peds; about 75 percent, by volume, chert and siltstone fragments; soft gray and brown partly weathered bands or streaks of chert, siltstone, or limestone; very strongly acid.

Thickness of the solum ranges from 60 to 80 inches. The A horizon is slightly acid to very strongly acid, and the B horizon is strongly acid to extremely acid.

The A horizon ranges from 2 to 14 inches in thickness. The A1 or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3. Chert and siltstone fragments make up 35 to 50 percent of the volume.

The B1 horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 or value of 5 and chroma of 6. It is very cherty silt loam or very cherty silty clay loam.

The B2t horizon has hue of 5YR or 2.5YR, value of 4, and chroma of 6 or 8, or it has hue of 2.5YR, value of 3 or 5, and chroma of 6. It is very cherty silty clay or clay. Chert and siltstone fragments make up 50 to 85 percent of the volume.

Peridge series

The Peridge series consists of deep, well drained, moderately permeable, gently sloping soils on uplands and stream terraces in the Ozark Highlands. These soils formed in residuum of cherty limestone or interbedded limestone, siltstone, and sandstone or in alluvium from these materials. The native vegetation was hardwood trees. Slopes are 3 to 8 percent.

Peridge soils are geographically associated with Arkana, Secesh, and Wideman soils. Arkana soils are on limestone ridges at a slightly higher elevation than the Peridge soils; they have a very-fine control section and are moderately deep. Secesh soils are on narrow flood plains at a lower elevation, have a fine-loamy control section, and have more coarse fragments in the lower

part of the subsoil. Wideman soils are on flood plains along streams at a lower elevation; they have a sandy control section.

Typical pedon of Peridge silt loam, 3 to 8 percent slopes, in a moist pasture in the SE1/4NE1/4NE1/4 sec. 5, T. 13 N., R. 7 W.

Ap—0 to 6 inches; dark brown (7.5YR 4/4) silt loam; weak medium granular structure; friable; many fine and medium roots; about 5 percent, by volume, chert and siltstone fragments; strongly acid; abrupt smooth boundary.

B1—6 to 13 inches; strong brown (7.5YR 4/6) silt loam; weak medium subangular blocky structure; firm; many fine and medium roots; about 5 percent, by volume, chert and siltstone fragments; strongly acid; clear smooth boundary.

B21t—13 to 20 inches; yellowish red (5YR 4/6) silty clay loam; moderate medium subangular blocky structure; firm; few patchy clay films on faces of peds and in pores; many fine and medium roots; about 5 percent, by volume, chert and siltstone fragments; very strongly acid; clear smooth boundary.

B22t—20 to 40 inches; red (2.5YR 4/6) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; thick dark red continuous clay films on faces of peds and in pores; common fine and medium roots; about 5 percent, by volume, chert and siltstone fragments; very strongly acid; clear wavy boundary.

B23t—40 to 55 inches; variegated red (2.5YR 4/6) and yellowish red (5YR 5/6) gravelly silty clay loam; moderate medium subangular blocky structure; firm; thick continuous clay films between peds; few common medium pale brown pockets of soft weathered siltstone; about 30 percent, by volume, chert and siltstone fragments; few fine dark concretions; strongly acid; clear wavy boundary.

B24t—55 to 72 inches; red (2.5YR 4/6) silty clay loam; common medium prominent pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; firm; continuous distinct clay films on faces of peds and in pores; few fine roots; about 5 percent, by volume, chert and siltstone fragments; strongly acid.

The thickness of the solum is 80 inches or more. The soil is medium acid to very strongly acid throughout.

The A horizon is 4 to 6 inches thick. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3, or it has hue of 7.5YR, value of 4, and chroma of 4.

The B1 horizon has hue of 7.5YR, value of 4 or 5, and chroma of 4 or 6.

The B2t horizon has hue of 2.5YR or 5YR, value of 4, and chroma of 6 or 8; or it has hue of 7.5YR, value of 5 or 6, and chroma of 6; or it is variegated in shades of brown and red. Mottles have hue of 10YR, value of 6, and chroma of 3 or value of 5 and chroma of 6. The B2t horizon is silt loam or silty clay loam.

Portia series

The Portia series consists of deep, well drained, moderately slowly permeable, gently sloping to moderately sloping soils on uplands in the Ozark Highlands. These soils formed in residuum of sandstone, siltstone, and limestone bedrock. The native vegetation was mixed hardwood forest. Slopes are 3 to 12 percent.

Portia soils are geographically associated with Boden, Brockwell, Lily, and Ramsey soils. Boden soils are on ridgetops and side slopes at a higher elevation than the Portia soils. They have a clayey control section. Brockwell soils are on adjacent uplands at a slightly higher elevation and have a coarse-loamy control section. Lily soils are on adjacent uplands at a slightly higher elevation and are moderately deep. Ramsey soils are at a slightly higher elevation, are shallow, and do not have an argillic horizon.

Typical pedon of Portia fine sandy loam, 3 to 8 percent slopes, in a moist pasture in the SW1/4SW1/4SE1/4 sec. 26, T. 15 N., R. 6 W.

Ap—0 to 4 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; medium acid; clear smooth boundary.

A2—4 to 12 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; strongly acid; clear wavy boundary.

B21t—12 to 26 inches; yellowish red (5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; patchy clay films on faces of peds; about 5 percent, by volume, sandstone fragments; strongly acid; gradual smooth boundary.

B22t—26 to 42 inches; yellowish red (5YR 4/6) sandy clay loam; few fine distinct red and prominent yellowish brown mottles; moderate medium subangular blocky structure; friable; continuous clay films on faces of peds; few fine roots; many fine pores; about 5 percent, by volume, sandstone fragments; strongly acid; gradual wavy boundary.

B23t—42 to 72 inches; red (2.5YR 4/6) sandy clay loam; common medium prominent yellowish brown (10YR 5/6) and gray (10YR 6/1) mottles and few fine prominent strong brown mottles; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; few skeletans and clay balls; few patches of uncoated sand grains along vertical faces of peds; medium acid.

The thickness of the solum ranges from 60 to 80 inches or more. The soil is medium acid to strongly acid throughout.

The A horizon is 3 to 17 inches thick. The Ap horizon has hue of 10YR, value of 4, and chroma of 2, 3, or 4 or value of 5 and chroma of 3. The A2 horizon has hue of 10YR, value of 5, and chroma of 3 or 4.

The B1 horizon, where present, has hue of 7.5YR, value of 5, and chroma of 4, 6, or 8. It is silt loam or fine sandy loam.

The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8, or it has hue of 7.5YR, value of 5, and chroma of 6 or 8. In the upper part the mottles are in shades of red and brown, and in the lower part they are in shades of brown and gray. The B2t horizon is clay loam, sandy clay, loam, or sandy clay loam.

Ramsey series

The Ramsey series consists of shallow, somewhat excessively drained, rapidly permeable, moderately sloping to steep soils on uplands. These soils formed in residuum of acid sandstone. Slopes are 8 to 30 percent.

Ramsey soils are geographically associated with Brockwell, Lily, and Portia soils. Brockwell soils are at a slightly higher elevation than the Ramsey soils, are deep to bedrock, and have an argillic horizon. Lily soils are on a similar landscape and are moderately deep to bedrock. Portia soils are on lower side slopes, are more than 60 inches deep to bedrock, and have an argillic horizon.

Typical pedon of Ramsey fine sandy loam, in an area of Lily-Ramsey-Rock outcrop complex, 8 to 30 percent slopes, in a wooded area in the SW1/4NE1/4SE1/4 sec. 35, T. 15 N., R. 6 W.

A1—0 to 2 inches; dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; 5 percent, by volume, sandstone fragments 6 to 12 inches in diameter; strongly acid; abrupt smooth boundary.

A2—2 to 5 inches; dark brown (10YR 4/3) fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; 5 percent, by volume, sandstone fragments 6 to 12 inches in diameter; very strongly acid; abrupt smooth boundary.

B21—5 to 9 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable; common medium roots and pores; 10 percent, by volume, sandstone fragments 6 to 12 inches in diameter; very strongly acid; abrupt smooth boundary.

B22—9 to 14 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots and pores; 10 percent, by volume, sandstone fragments 6 to 12 inches in diameter; very strongly acid; abrupt smooth boundary.

R—14 inches; hard level-bedded acid sandstone bedrock.

The thickness of the solum and the depth to bedrock range from 9 to 20 inches. The soil is strongly acid or very strongly acid throughout.

The A horizon ranges from 3 to 7 inches in thickness. The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A2 horizon has hue of 10YR, value of 4, and chroma of 2 or 3 or value of 5 and chroma of 3 or 4. Coarse fragments make up 2 to 15 percent of the volume.

The B horizon has hue of 10YR, value of 4, and chroma of 4 or value of 5 and chroma of 4 or 6, or it has hue of 7.5YR, value of 5, and chroma of 6. It is fine sandy loam or sandy loam. Coarse fragments make up 5 to 15 percent of the volume.

The R horizon is hard acid sandstone.

Saffell series

The Saffell series consists of deep, well drained, moderately permeable, moderately sloping to moderately steep soils on side slopes and ridgetops. These soils formed in sandy or clayey marine and fluvial deposits that have a high content of gravel. The native vegetation was mixed hardwoods and pines. Slopes range from 8 to 20 percent.

Saffell soils are geographically associated with Loring soils. Loring soils are on adjacent uplands and terraces at a slightly lower elevation than the Saffell soils. They have a fragipan and a fine-silty control section.

Typical pedon of Saffell gravelly fine sandy loam, 12 to 20 percent slopes, in a moist pasture in the SW1/4SE1/4NE1/4 sec. 11, T. 13 N., R. 5 W.

Ap—0 to 3 inches; dark brown (10YR 4/3) gravelly fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; about 30 percent, by volume, pebbles; strongly acid; clear smooth boundary.

A2—3 to 8 inches; brown (10YR 5/3) gravelly fine sandy loam; weak fine and medium granular structure; friable; many fine and medium roots; about 35 percent, by volume, pebbles; strongly acid; clear wavy boundary.

B1—8 to 14 inches; strong brown (7.5YR 5/6) very gravelly fine sandy loam; weak fine subangular blocky structure; friable; many fine and medium roots; about 45 percent, by volume, pebbles; very strongly acid; clear wavy boundary.

B21t—14 to 26 inches; yellowish red (5YR 4/6) very gravelly sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; about 60 percent, by volume, pebbles; thin discontinuous patchy clay films on faces of peds; clay coatings and bridgings on sand grains; strongly acid; gradual smooth boundary.

B22t—26 to 42 inches; yellowish red (5YR 4/6) very gravelly sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; about 65 percent, by volume, pebbles; thin discontinuous patchy clay films on faces of peds; clay coatings and bridgings on some sand grains; strongly acid; gradual wavy boundary.

B3—42 to 52 inches; yellowish red (5YR 5/6) very gravelly sandy clay loam; few medium prominent red (2.5YR 4/6) soft weathered sandstone relicts; weak medium granular structure; very friable; about 40 percent, by volume, pebbles; clay coatings on some sand grains; strongly acid; gradual irregular boundary.

C—52 to 72 inches; yellowish red (5YR 5/6) gravelly sandy loam; few medium prominent red (2.5YR 4/6), yellowish brown (10YR 5/6), and gray (10YR 6/1) soft weathered sandstone relicts; massive; very friable; about 20 percent, by volume, pebbles; strongly acid.

The solum is 35 to 60 inches thick. The soil is strongly acid or very strongly acid throughout.

The A horizon is 5 to 12 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Pebbles make up 15 to 35 percent of the volume.

The B1 horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 or 6. It is very gravelly fine sandy loam or very gravelly sandy clay loam.

The B2t and the B3 horizons have hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. They are very gravelly fine sandy loam, very gravelly loam, or very gravelly sandy clay loam. Pebbles make up 35 to 65 percent of the volume.

The C horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6. It has red, brown, and gray soft weathered sandstone relicts. The C horizon is gravelly sandy loam or very gravelly loamy sand. Pebbles make up 20 to 75 percent of the volume.

Secesh series

The Secesh series consists of deep, well drained, moderately permeable, nearly level soils on stream terraces in the Ozark Highlands. These soils formed in about 2 feet of loamy and cherty alluvium on flood plains. They are frequently flooded late in winter and early in spring. The native vegetation was mixed grasses and hardwoods. Slopes are 1 to 3 percent.

Secesh soils are geographically associated with Boden, Captina, and Peridge soils. Boden soils are on uplands at a higher elevation than the Secesh soils. They have a clayey control section. Captina soils are on stream terraces and uplands at a higher elevation. They have a fragipan and a fine-silty control section. Peridge soils are on stream terraces at a slightly higher elevation. They have a fine-silty control section and fewer chert fragments.

Typical pedon of Secesh silt loam, frequently flooded, in a moist pasture in the NE1/4NE1/4SE1/4 sec. 20, T. 14 N., R. 4 W.

Ap—0 to 6 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; friable; common fine roots; about 15 percent, by volume, chert fragments; slightly acid; abrupt smooth boundary.

B1—6 to 14 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; common fine roots; about 10 percent, by volume, chert fragments; medium acid; clear wavy boundary.

B21t—14 to 20 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; firm; few fine roots; few thin patchy clay films on faces of peds; about 5 percent, by volume, chert fragments; medium acid; clear wavy boundary.

B22t—20 to 25 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; firm; few patchy clay films on faces of peds; about 10 percent, by volume, chert fragments; strongly acid; gradual wavy boundary.

B23t—25 to 36 inches; strong brown (7.5YR 5/6) cherty silt loam; common medium distinct light yellowish brown (10YR 6/4) mottles; strong medium subangular blocky structure; firm; common patchy clay films on faces of peds; about 30 percent, by volume, chert fragments; common organic stains; strongly acid; gradual wavy boundary.

B3t—36 to 52 inches; equally mottled pale brown (10YR 6/3) and dark yellowish brown (10YR 4/4) very cherty silt loam; strong medium subangular blocky structure; firm; common patchy clay films on faces of peds; about 40 percent, by volume, chert fragments; common dark organic stains; strongly acid; gradual wavy boundary.

B3—52 to 62 inches; mottled yellowish brown (10YR 5/4), pale brown (10YR 6/3), and light brownish gray (10YR 6/2) very cherty silt loam; weak medium subangular blocky structure parting to massive; firm, cemented; about 65 percent, by volume, rounded and angular chert fragments; common dark stains; strongly acid; gradual wavy boundary.

C1—62 to 69 inches; mottled brown (10YR 5/3) and light brownish gray (10YR 6/2) very cherty silt loam; massive; firm, cemented; dark stains on gravel; about 65 percent, by volume, rounded and angular chert fragments; strongly acid; gradual wavy boundary.
C2—69 to 72 inches; mottled dark yellowish brown (10YR 4/4) and pale brown (10YR 6/3) very cherty silt loam; massive; cemented; about 75 percent, by volume, rounded and angular chert fragments; dark stains on chert fragments; strongly acid.

Thickness of the solum ranges from 30 to 60 inches or more. The A and B1 horizons are slightly acid or medium acid, and the B2, B3, and C horizons are medium acid or strongly acid.

The A horizon ranges from 3 to 8 inches in thickness. It has hue of 10YR, value of 3, and chroma of 2 or 3. Coarse fragments make up 0 to 15 percent of the volume.

The upper part of the B2t horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4, 6, or 8. The lower part of the B horizon is mottled in shades of brown and gray. Coarse fragments make up 10 to 15 percent of the volume in the upper part and 15 to 50 percent in the lower part. The B horizon is silt loam or silty clay loam or the cherty or very cherty analog.

The C horizon has hue of 10YR, value of 4, 5, or 6, and chroma of 2, 3, or 4, or it is equally mottled in these colors. Coarse fragments make up 10 to 80 percent of the volume.

Secesh soils in Independence County have chroma of 2, 3, and 4 and have texture of silt loam in the lower part of the profile. These characteristics are beyond the range for the Secesh series, thus the soils are a taxadjunct to the series. The differences, however, do not affect the use and management of the soils.

Sidon series

The Sidon series consists of deep, moderately well drained, slowly permeable, nearly level to moderately sloping soils on plateaus, ridgetops, and side slopes in the Boston Mountains. These soils formed in loamy residuum of sandstone and interbedded siltstone and shale. The native vegetation was mixed hardwoods and pines. Slopes are 1 to 12 percent.

Sidon soils are geographically associated with Enders, Linker, and Mountainburg soils. Enders soils are on adjacent hillsides at a lower elevation than the Sidon soils. They have a clayey control section and do not have a fragipan. Linker soils are on a similar landscape. They have a fragipan and are moderately deep to bedrock. Mountainburg soils are on adjacent uplands at a higher elevation. They have a loamy-skeletal control section, are shallow, and do not have a fragipan.

Typical pedon of Sidon silt loam, 3 to 8 percent slopes, in a moist pasture in the SW1/4NE1/4SW1/4 sec. 31, T. 11 N., R. 6 W.

Ap—0 to 4 inches; yellowish brown (10YR 5/4) silt loam; weak medium granular structure; very friable; many fine roots; few fine pores; strongly acid; abrupt smooth boundary.
B21t—4 to 14 inches; strong brown (7.5YR 5/6) loam; weak medium subangular blocky structure; friable; many fine roots; common fine pores; few patchy clay films on faces of peds and in pores; few black stains; very strongly acid; clear wavy boundary.
B22t—14 to 24 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; firm; few fine roots; common fine pores; few thin patchy clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.
Bx—24 to 38 inches; yellowish brown (10YR 5/8) clay loam; few medium prominent red (2.5YR 4/6), light brownish gray (10YR 6/2), and gray (10YR 6/1) mottles; weak coarse prismatic structure parting to weak medium angular blocky; firm; about 65 percent compact and brittle; few fine pores; continuous distinct clay films on faces of peds and in pores; thin streaks and patches of clean silt and sand grains between prisms and some peds; about 5 percent, by volume, sandstone fragments; very strongly acid; gradual wavy boundary.
B3—38 to 45 inches; yellowish brown (10YR 5/8) clay loam; common medium prominent red (2.5YR 4/6) and many common medium distinct gray (10YR 6/1) mottles and streaks; weak thick platy structure parting to weak medium subangular blocky; firm; slightly brittle; few horizontal and few vertical streaks of continuous distinct clay films and small patches of clean sand grains; about 15 percent, by volume, angular sandstone fragments 1/8 inch to 2 1/2 inches in diameter; very strongly acid; clear wavy boundary.
R—45 inches; level-bedded acid sandstone.

Thickness of the solum and depth to hard bedrock range from 40 to 72 inches. The soil is strongly acid or very strongly acid throughout. Depth to the fragipan ranges from 20 to 36 inches.

The A horizon ranges from 4 to 8 inches in thickness. It has hue of 10YR, value of 4 or 5, and chroma of 3 or 4.

The B2t horizon has hue of 10YR or 7.5R, value of 5, and chroma of 6 or 8. It is silty clay loam, clay loam, or loam.

The Bx horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8. Mottles are in shades of red, brown, and gray. The Bx horizon is clay loam or loam. Gravel makes up 0 to 35 percent of the volume.

The B3 horizon is similar in color to the Bx horizon. It is loam or clay loam or a gravelly modifier. Coarse fragments make up 0 to 35 percent of the volume. In some places there is a C horizon 1 to 6 inches thick that is similar in color to the Bx horizon.

Spadra series

The Spadra series consists of deep, well drained, moderately permeable, level soils on stream terraces. These soils formed in loamy alluvium mainly from soils that formed in residuum of sandstone, siltstone, and shale. The native vegetation was mixed hardwoods and pine. Slopes are 0 to 1 percent.

Spadra soils are geographically associated with Enders, Linker, and Portia soils. Enders soils are on adjacent hillsides at a higher elevation than the Spadra soils and have a clayey control section. Linker soils are on adjacent plateaus and side slopes at a higher elevation and are moderately deep. Portia soils are on adjacent uplands at a slightly higher elevation and have a solum more than 72 inches thick.

Typical pedon of Spadra fine sandy loam, 0 to 1 percent slopes, in a moist cultivated field in the NW1/4SW1/4NW1/4 sec. 15, T. 13 N., R. 4 W.

Ap—0 to 8 inches; dark brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; very friable; many fine roots; many fine pores; strongly acid; clear smooth boundary.

B21t—8 to 22 inches; reddish brown (5YR 4/4) loam; weak medium subangular blocky structure; friable; few patchy clay films on faces of peds; many fine roots; few black stains; strongly acid; gradual smooth boundary.

B22t—22 to 40 inches; dark brown (7.5YR 4/4) loam; weak medium subangular blocky structure; friable; few patchy distinct clay films on faces of peds; many fine pores; strongly acid; gradual smooth boundary.

B3—40 to 60 inches; reddish brown (5YR 4/4) fine sandy loam; weak fine subangular blocky structure; friable; very strongly acid; gradual smooth boundary.

C—60 to 72 inches; reddish brown (5YR 4/4) fine sandy loam; massive; very friable; pocket of clean sand and gravel as much as 1/2 inch in diameter; very strongly acid.

Thickness of the solum ranges from 40 to 60 inches. The soil is medium acid to very strongly acid throughout.

The A horizon ranges from 5 to 10 inches in thickness. It has hue of 10YR, value of 3 or 4, and chroma of 4, or it has hue of 7.5YR, value of 4, and chroma of 4.

The B2t horizon has hue of 7.5YR, value of 4, and chroma of 4, or it has hue of 5YR, value of 4 or 5, and chroma of 4 or 6. In some places there are few to common brown or yellow mottles. The B2t horizon is loam or sandy clay loam.

The B3 and C horizons are similar in color to the B2t horizon. They are loam, fine sandy loam, or a gravelly modifier.

Sturkie series

The Sturkie series consists of deep, well drained, moderately permeable, level to nearly level soils on flood plains in the Ozark Highlands. These soils formed in silty alluvium. The native vegetation was mixed hardwoods and pine. Slopes are 0 to 3 percent.

Sturkie soils are geographically associated with Wideman soils. Wideman soils are on flood plains at a slightly lower elevation than the Sturkie soils. They have a sandy control section and do not have a mollic epipedon.

Typical pedon of Sturkie silt loam, frequently flooded, in a moist cultivated area in the NE1/4NW1/4SE1/4 sec. 4, T. 13 N., R. 8 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; very friable; many fine and medium roots; neutral; clear smooth boundary.

A12—8 to 26 inches; very dark grayish brown (10YR 3/2) silt loam; weak medium granular and weak medium subangular blocky structure; friable; many fine roots; neutral; clear smooth boundary.

B21—26 to 50 inches; dark brown (10YR 3/3) silty clay loam; moderate medium subangular blocky structure; friable; few dark organic stains; thin coatings of sand grains on faces of peds; mildly alkaline; gradual smooth boundary.

B22—50 to 72 inches; dark brown (10YR 3/3) silt loam; moderate medium subangular blocky structure; friable; few dark organic stains; few calcium carbonate concretions in the lower part; mildly alkaline.

The solum ranges from 50 to 80 inches in thickness. The zone of mollic colors ranges from 24 to more than 50 inches in thickness. The A horizon is mildly alkaline to medium acid. The B and C horizons are moderately alkaline to slightly acid.

The A horizon ranges from 20 to 36 inches in thickness. It has hue of 10YR, value of 3, and chroma of 2 or 3. Coarse fragments make up 0 to 5 percent of the volume.

The B2 horizon has hue of 10YR, value of 3, 4, or 5, and chroma of 3 or 4. It is silty clay loam or silt loam.

The C horizon, where present, is similar in color and texture to the B2 horizon. Mottles are in shades of yellow or brown. In some places, the lower part of the C horizon ranges from sandy loam to loamy fine sand. Coarse fragments make up 0 to 10 percent of the volume.

Taft series

The Taft series consists of somewhat poorly drained, slowly permeable, level to nearly level soils on terraces. These soils formed in silty material underlain by old alluvium or residuum of limestone or shale. The native vegetation was hardwood trees. Slopes are 0 to 2 percent.

Taft soils are geographically associated with Captina and Secesh soils. Captina soils are on upland and stream terraces at a higher elevation than the Taft soils. They are moderately well drained and do not have tonguing of the albic horizon in the B horizon. Secesh soils are on stream terraces at a lower elevation. They have a fine-loamy control section and do not have a fragipan.

Typical pedon of Taft silt loam, 0 to 2 percent slopes, in a moist wooded area in the SE1/4SE1/4SW1/4 sec. 2, T. 13 N., R. 6 W.

Ap—0 to 7 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct dark yellowish brown mottles; weak medium granular structure; very friable; many fine roots; very strongly acid; abrupt smooth boundary.

A2—7 to 14 inches; brown (10YR 5/3) silt loam; few fine distinct dark brown and dark yellowish brown mottles; weak medium granular structure; friable; many fine roots; few dark concretions; very strongly acid; clear smooth boundary.

B2—14 to 22 inches; pale brown (10YR 6/3) silt loam; common medium distinct light brownish gray (10YR 6/2) and brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; common fine roots; few dark concretions; very strongly acid; clear smooth boundary.

B'x1&A'2—22 to 30 inches; mottled light brownish gray (10YR 6/2) and strong brown (7.5YR 5/8) silty clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; compact and brittle; about 10 percent, by volume, vertical gray silt tongues 1/2 inch to 1 inch wide; few dark concretions; very strongly acid; clear smooth boundary.

B'x2—30 to 46 inches; mottled light gray (10YR 7/2), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/8) silty clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; compact and brittle; vertical gray silt tongues as much as 1/2 inch wide; few patchy clay films on faces of peds; few dark concretions; very strongly acid; clear smooth boundary.

B'2t—46 to 72 inches; coarsely mottled light gray (10YR 7/1), brownish yellow (10YR 6/6), yellowish brown (10YR 5/6), and strong brown (7.5YR 4/6) silty clay loam; moderate subangular blocky structure; firm; common patchy clay films; few chert fragments in lower part; few dark concretions; very strongly acid.

Thickness of the solum ranges from 50 to 60 or more inches. Depth to the fragipan ranges from 20 to 36 inches. The soil is strongly acid or very strongly acid throughout.

The A horizon ranges from 5 to 15 inches in thickness. It has hue of 10YR, value of 4, and chroma of 2 or value of 5 or 6 and chroma of 3 or 4; or it has hue of 2.5Y, value of 5, and chroma of 4.

The B2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4, or it has hue of 2.5Y, value of 5 or 6, and chroma of 4. Mottles are in shades of brown and gray. The B2 horizon is silt loam or silty clay loam.

The Bx horizon is evenly mottled brown and gray, or it has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4. Gray silt tongues are 1/2 to 1 inch wide. The Bx horizon is silt loam or silty clay loam.

The B'2t horizon is coarsely mottled in shades of gray, brown, and yellow. It is silt loam, silty clay loam, or silty clay.

Wallen series

The Wallen series consists of moderately deep, somewhat excessively drained, moderately rapidly permeable, gently sloping to steep soils on side slopes and ridgetops in the Ozark Highlands. These soils formed in colluvium or residuum of siltstone or interbedded siltstone, shale, and fine-grained sandstone. The native vegetation was hardwood trees. Slopes are 3 to 30 percent.

Wallen soils are geographically associated with Captina soils. Captina soils are on stream terraces at a lower elevation than the Wallen soils. They have a fragipan and a fine-silty control section.

Typical pedon of Wallen gravelly silt loam, 3 to 8 percent slopes, in a moist pasture in the NW1/4NE1/4NE1/4 sec. 19, T. 13 N., R. 5 W.

Ap—0 to 3 inches; dark brown (10YR 4/3) gravelly silt loam; weak fine granular structure; very friable; common fine roots; common fine pores; about 25 percent, by volume, siltstone fragments 1 inch to 3 inches in diameter and a few fragments of siltstone more than 3 inches in diameter; medium acid; clear smooth boundary.

A2—3 to 8 inches; brown (10YR 5/3) gravelly silt loam; weak medium granular structure; very friable; few fine roots; some mixing of dark brown material from the Ap horizon; about 30 percent, by volume, siltstone fragments 1/8 inch to 3 inches in diameter and a few siltstone fragments more than 3 inches in diameter; strongly acid; clear wavy boundary.

B21—8 to 18 inches; yellowish brown (10YR 5/4) very cobbly silt loam; weak medium subangular blocky structure; friable; common fine and medium pores; about 25 percent, by volume, siltstone fragments 1 inch to 3 inches in diameter and about 30 percent, by volume, siltstone fragments more than 3 inches in diameter; strongly acid; clear wavy boundary.

B22—18 to 26 inches; yellowish brown (10YR 5/6) very cobbly silt loam; few medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; about 30 percent, by volume, siltstone fragments 1 inch to 3 inches in diameter and about 30 percent siltstone fragments more than 3 inches in diameter; strongly acid; abrupt smooth boundary.

R—26 inches; hard level-bedded siltstone; cracks 1/8 inch to 2 inches wide filled with yellowish brown (10YR 5/4) silt loam and red (2.5YR 4/6) clay loam; fractured brick-sized vertical and horizontal planes; red (2.5YR 4/6) clay and yellowish brown (10YR 5/4) silt on both planes.

Thickness of the solum and depth to bedrock range from 20 to 40 inches. The soil is medium acid to very strongly acid throughout.

The A horizon ranges from 5 to 10 inches in thickness. It has hue of 10YR, value of 4, 5, or 6, and chroma of 3 or 4. Coarse fragments 1 to 5 inches in diameter make up 15 to 35 percent of the volume.

The B horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 or 6. It is very cobbly silt loam or very cobbly loam. Mottles in the lower part of the horizon are in shades of brown and red. Coarse fragments 1 to 10 inches in diameter make up 35 to 70 percent of the volume.

The Cr horizon, where present, is highly weathered siltstone or fine-grained sandstone. It has many rock fragments.

Wideman series

The Wideman series consists of deep, excessively drained, moderately rapidly permeable, level soils on flood plains. These soils formed in sandy alluvium that has thin strata of finer textured material. They are frequently flooded late in winter and early in spring. The native vegetation was bottom land hardwoods. Slopes are 0 to 1 percent.

Wideman soils are geographically associated with Arrington, Sturkie, and Peridge soils. Arrington soils are on natural levees at a higher elevation than the Wideman soils. They have a fine-silty control section and a mollic epipedon. Sturkie soils are on adjacent flood plains at a slightly higher elevation and have a fine-silty control section and a mollic epipedon. Peridge soils are on terraces at a higher elevation and have a fine-silty control section.

Typical pedon of Wideman loamy fine sand, frequently flooded, in a moist pasture in the NW1/4SE1/4NW1/4 sec. 9, T. 13 N., R. 6 W.

Ap—0 to 4 inches; brown (10YR 4/3) loamy fine sand; weak medium granular structure; very friable; common fine roots; neutral; clear wavy boundary.

A2—4 to 10 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium granular structure; very friable; few fine roots; slightly acid; clear wavy boundary.

C1—10 to 21 inches; yellowish brown (10YR 5/4) fine sand; single grained; loose; neutral; clear smooth boundary.

C2—21 to 30 inches; dark yellowish brown (10YR 4/4) fine sand; single grained; very friable; neutral; clear wavy boundary.

C3—30 to 36 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; neutral; clear wavy boundary.

C4—36 to 40 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; slightly acid; clear smooth boundary.

C5—40 to 44 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium granular structure; very friable; slightly acid; clear wavy boundary.

C6—44 to 52 inches; dark yellowish brown (10YR 4/4) loamy fine sand; single grained; loose; neutral; clear wavy boundary.

C7—52 to 64 inches; light yellowish brown (10YR 6/4) loamy fine sand; single grained; loose; neutral; clear wavy boundary.

C8—64 to 72 inches; dark yellowish brown (10YR 4/4) fine sandy loam; friable; slightly acid.

The sandy sediment ranges in thickness from 60 to 80 inches or more. The A horizon is medium acid to extremely acid, except for the surface layer where lime has been added. The C horizon is mildly alkaline to strongly acid.

The A horizon ranges from 3 to 10 inches in thickness. It has hue of 10YR, value of 3, 4, or 5, and chroma of 2, 3, or 4.

The C horizon has hue of 10YR, value of 4, 5, 6, or 7, and chroma of 3 or 4, or it has hue of 7.5YR, value of 5 or 6, and chroma of 8. It is loamy sand or fine sand and has thin strata of loamy very fine sand or finer textured material. In places coarse fragments, mainly gravel, make up 0 to 20 percent, by volume, of the lower part of the C horizon.

formation of the soils

In this section the factors of soil formation are discussed and are related to the soils in the county. In addition, the processes of soil formation are described.

factors of soil formation

Soil is the natural medium for the growth of plants. It is the product of soil-forming processes acting on accumulated geologic material. The five important factors in soil formation are parent material, climate, living organisms (plants and animals), relief, and time.

Climate and living organisms are the active forces in soil formation. Their effect on the parent material is modified by relief and by the length of time the parent material has been in place. The importance of each factor differs from place to place. In some places a single dominant factor fixes most of the properties of the soil that is formed, but in general the interaction of all five factors determines what kind of soil is formed at any given place.

Although soil formation is complex, a clearer understanding of the soil-forming processes may be gained by considering each of the five factors separately. It must be remembered, however, that each of the five factors is affected by and also affects each of the others.

climate

The climate of Independence County is characterized by mild winters, warm or hot summers, and generally abundant rainfall. The present climate probably is similar to the one that influenced soil formation in the past. The average temperature at Batesville in July is 80 degrees F, and the average in January is 38 degrees. In the Ozark Highlands, temperatures are generally a few degrees lower than elsewhere. The total annual rainfall is about 48 inches and is well distributed throughout the year. The section "General nature of the survey area" discusses the climate of Independence County.

The warm, moist climate promotes rapid soil formation. The warmth promotes rapid chemical reaction, and the abundant rainfall makes a large amount of water available for dissolving and moving dissolved and suspended material downward in the soil. As a result, the remains of plants decompose rapidly, and the acids released from organic decomposition enhance the breakdown of base-containing minerals. This process yields soluble nutrients, minerals (clay, for example), and oxides (iron and aluminum). Soil development can continue almost the year round because the soil is frozen only to a shallow depth and only for a short period. The climate throughout the county is relatively uniform. Its effects are modified locally by vegetation and relief. Climate alone does not account for the differences in the soils in the county.

living organisms

Living organisms, including rodents, insects, bacteria, and fungi, are important in the formation of soils. They furnish organic matter and bring up plant nutrients from the lower horizons to the upper ones. In addition, they add nitrogen and change the structure and porosity of the soils.

Before Independence County was settled, the native vegetation had more influence on soil formation than did animal activities. On the flood plains the trees were dominantly hardwoods. The main species were oak, ash, sweetgum, sycamore, pecan, hickory, and cottonwood. On the uplands, where soils formed mainly in residuum of sedimentary bedrock, the trees were dominantly oak, hickory, ash, elm, and eastern redcedar or mixed hardwoods and pine.

Man affects the future rate of soil formation through many activities. He clears and tills the soil, introduces new varieties of plants, and adds lime, fertilizer, and chemicals for weed, insect, and disease control. He improves drainage, controls floods and fires, and grades and smooths the surface of the soil. Some of the results of man's activities are evident now; others, however, will not be evident for many centuries.

parent material

The soils in Independence County formed in alluvium, wind-transported loess, and residuum of Paleozoic bedrock.

The Springfield and Salem Plateaus of the Ozark Region begin to rise west of the Black River flood plain. The exposed strata in this area are the St. Peter Sandstone and Everton Formation of the Middle Ordovician period and the Boone Formation and the Batesville Sandstone and Moorefield Formation of the Mississippian period. These formations consist primarily of limestone, sandstone, chert, shale, and siltstone. The soils in this area formed in material derived from these

bedrocks, except in those places that are capped by loess deposits.

Boden, Lily, and Portia soils formed primarily in residuum of sandstone or sandy limestone.

Arkana, Clarksville, Gepp, Moko, Noark, and Wallen soils formed in residual or colluvial material that weathered from cherty limestone, limestone, or dolomite and partly from beds of shale and siltstone. The Boone Formation crops out in the north-central part of the county and has large amounts of chert. Clarksville soils are more prevalent in areas of the Boone Formation. Arkana, Moko, and Gepp soils are more prevalent in areas of the Everton Formation. Limestone weathers more rapidly than chert. Consequently, soils that have a large amount of chert, Clarksville soils, for example, are generally on the peaks and points of ridgetops. Soils that formed in limestone containing less chert, Gepp soils, for example, are generally at a lower elevation. The clayey subsoil of the Arkana, Gepp, and Noark soils is a characteristic inherited from the argillaceous qualities of the parent material.

Loring soils formed at a lower elevation adjacent to the Ozark Region where the loess mantle is thickest, namely in areas along the foot slopes adjacent to the Black River flood plain. Further westward, where the loess mantle thins, Captina soils formed partly in loess and partly in material that weathered from cherty limestone.

Deposits from streams flowing through the Ozark Region are high in silt and in some places high in sand. The more readily transported materials were washed from the soils on uplands or from similar materials. Most of the chert fragments, which are resistant to weathering and transportation, remain in place. Most of the suspended clay particles were not deposited locally. Hontas, Sturkie, and Wideman soils formed in the resulting loamy and sandy, predominantly chert-free material.

The Boston Mountains begin to rise south of the White River flood plain. The exposed Pennsylvanian age formations are Bloyd Shale and the Prairie Grove and Cane Hill members of the Hale Formation. The exposed Upper Mississippian formations are Pitkin Limestone and Fayetteville Shale. Except in those places that are capped by siltstone deposits, the soils in this area formed in material derived from these rocks. Moko and Newnata soils formed in residuum primarily of Pitkin Limestone, Fayetteville Shale, and miscellaneous limestone and calcareous shale members of the Hale Formation. They are on the foot slopes of the plateau adjacent to the White River flood plains. Soils that formed in acid shale or interbedded sandstone and shale, Enders soils, for example, are on the upper part of the hill slopes. Sandstone fragments are concentrated primarily in the surface layer. There are few or no sandstone fragments in the subsoil. The clayey subsoil of Newnata and Enders soils is a characteristic inherited from the argillaceous qualities of the parent material.

Alluvium from streams flowing through the Boston Mountains is high in silt and fine sand. The more readily transported material was washed from the uplands soils or from similar material. Most of the sandstone fragments, which are resistant to weathering and transportation, remain in place. Most of the clay particles suspended in runoff were not deposited locally. Spadra and Taft soils formed in silty and loamy, predominantly gravel-free alluvium.

Other soils formed in alluvium deposited by large rivers. Differences in the soils and the wide range in texture of sediments in this part of the county are caused by the differences in the sedimentary environment. As rivers rise and overflow their banks and spread over the flood plains, the coarser sediment is deposited first. Therefore, sand is deposited in bands parallel to and near the river. Such sediment forms the low ridges known as natural levees. Wideman soils are the main soils in this part of the flood plain area. As the floodwater continues to spread from the main channel, silty and loamy sediment is deposited. Arrington, Amagon, Askew, and Dubbs soils formed in such sediment. When the floodwater recedes and water is left standing in marshes, swamps, and depressions, clayey sediment is deposited. The Egam, Forestdale, and Jackport soils formed in this kind of sediment.

Thousands of years ago, wide troughs were carved between Crowleys Ridge and the Ozark Region. These troughs were subsequently filled with sediment from an early course of the Mississippi River. The Black River flood plain presently occupies part of that old Mississippi River flood plain.

Where the high natural levees merge with the broad flats, the sediment has less sand and more silt. Amagon, Askew, and Dubbs soils formed in this kind of sediment.

The Mississippi River finally abandoned its flood plain, which formed much of the eastern part of Independence County and some adjacent counties, in favor of channels to the east. The broad, abandoned swamps and marshes were drained by small local streams such as Departee Creek, Curia Creek, Carter Creek, and Dota Creek. These streams were inadequate to maintain broad areas as active flood plains.

The higher parts of that old flood plain that was no longer flooded were mantled with loess several thousand years ago. Foley soils formed where the loess is thickest in the county. Crowley soils formed where the loess is thin over clayey alluvial sediment. Jackport soils formed where the loess is thinnest. Amagon, Dubbs, Askew, and Forestdale soils formed on remnants of old natural levees.

relief

Relief affects drainage, runoff, erosion, and the percolation of water through the soil. Some of the

greatest differences among the soils are mainly the result of differences in relief.

Relief in the area of the Ozark Region in Independence County ranges from steep dissected hill slopes to gently sloping summits, narrow ridges, and terraces. The major soils in this area are Arkana, Boden, Brockwell, Captina, Clarksville, Gepp, Lily, Moko, Noark, Peridge, Portia, and Wallen soils.

Relief in the area of the Boston Mountains ranges from gently sloping to very steep ridges and hillsides to nearly level to undulating summits, terraces, and benches. The major soils in this area are Enders, Linker, Mountainburg, Sidon, Spadra, and Taft soils.

Relief in the bottom lands ranges from broad flats and depressions to undulating areas of swales and ridges. The major soils are Amagon, Forestdale, and Jackport soils on the broad flats and in depressions and Arrington, Askew, and Dubbs soils in the undulating areas.

The flood plains along creeks and rivers in the county are level to gently undulating. Most are subject to occasional or frequent flooding. The major soils in these areas are Hontas, Secesh, Sturkie, and Wideman soils.

time

The length of time required for the formation of a given type of soil depends largely on the other soil-forming factors. Less time is needed for the formation of soils in a warm and humid climate where vegetation is abundant than in a cooler or drier climate. If all other soil-forming processes are equal, less time is needed for soils to form in sandy or loamy parent material than in clayey parent material.

The soils in Independence County range from young to old in terms of geological time. The degree of soil development is not necessarily directly related to the length of time of soil formation because of the interaction of the other factors.

The soils in the eastern part of the county are relatively young in terms of geological time. The youngest soils are on the flood plains of present streams. These soils frequently receive fresh alluvial sediment and show only slight evidence of soil development and no evidence of translocated silicate clay. Hontas soils are the youngest soils in this part of the county. Crowley, Dubbs, Foley, Forestdale, and Jackport soils are the most mature soils.

The soils in the northern and southern parts of the county formed in material that weathered from bedrock of Mississippian and Pennsylvanian age. However, these soils are much younger than the bedrock because of geologic erosion since the time when the bedrock was uplifted. However, most of these soils show evidence of considerable age. They have a thick argillic horizon and are moderately deep to deep over bedrock. Clarksville, Enders, Gepp, and Noark soils are the oldest soils in this geological area, and Arkana, Moko, and Mountainburg soils are the youngest soils.

processes of soil formation

The effects of the soil-forming factors are recorded in the soil profile, which is a succession of layers, or horizons, from the surface to the parent material. The horizons differ in one or more properties such as color, texture, structure, consistency, and porosity.

Most soil profiles have three major horizons, which are called the A, B, and C horizons. Very young soils do not have a B horizon.

Two kinds of A horizon are recognized in the soils in this county. One is the horizon of maximum accumulation of organic matter. It is called the A1 horizon or surface layer. The other is the horizon of maximum leaching of dissolved or suspended material. It is called the A2 horizon or subsurface layer.

The B horizon is directly below the A horizon and is sometimes called the subsoil (*7*). It is typically the horizon of maximum accumulation of suspended material, clay and iron oxides, for example. The B horizon commonly has blocky structure and is firmer than the horizons immediately above and below it.

The C horizon is below the B horizon. The soil-forming processes have had little effect on the C horizon, although weathering can materially modify it. In some young soils, the C horizon directly underlies the A horizon and has been slightly modified by living organisms as well as by weathering.

Several processes have been active in the formation of soil horizons in Independence County. Among these processes are: (1) the accumulation of organic matter, (2) the leaching of bases, (3) the oxidation or reduction and transfer of iron, and (4) the formation and translocation of silicate clay minerals. In most of the soils in the county, more than one process has been active in soil formation.

In some soils, organic matter has accumulated in the upper part of the profile to form an A1 horizon. The soils in Independence County range from moderate to low in content of organic matter.

Leaching of bases has occurred to some degree in nearly all the soils in the county. It is generally accepted that excess bases are leached downward in the soil before silicate clay minerals begin to move. Most of the soils in the county are moderately leached. Some soils, however, for example, Hontas soils, are only slightly leached, and others, for example, Enders, Linker, and Mountainburg soils, are strongly leached.

Oxidation of iron is evident in the moderately well drained and well drained soils in the county, for example, Linker, Mountainburg, and Enders soils on uplands and Portia and Loring soils in valleys. Red and brown colors in the B horizon are an indication of the oxidation of iron.

Gleying, or the reduction and transfer of iron, has occurred to a significant degree in the poorly drained and somewhat poorly drained soils in the lowlands. Gray colors in the horizons below the surface indicate the reduction or loss of iron oxides, or both. Some horizons have reddish or yellowish mottles and concretions derived from segregated iron oxides. Gleying is very pronounced in the Amagon, Crowley, and Jackport soils.

Translocation of silicate clay minerals has contributed to horizon development in most of the soils in the county. In cultivated areas, most of the A2 horizon has been destroyed by erosion or incorporation into the Ap horizon. Where there is an A2 horizon, it commonly has weak subangular blocky structure and less clay than the underlying B horizon. Also, it is lighter in color than the underlying and overlying horizons. Clay films generally have accumulated in pores and on the faces of peds in the B horizon. Most of the carbonates and soluble salts probably were leached before the translocation of silicate clay began, although the content of bases is still high in some of the soils on lowlands.

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glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	More than 12

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage

results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of Vertisols—clayey soils having a high coefficient of expansion and contraction with changes in moisture content.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip—Water is applied slowly and under low pressure through such applicators as orifices, emitters, porous tubing, or perforated pipe on the surface of or in the soil.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3

inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

tables

TABLE 1.--ACREAGE OF PRINCIPAL CROPS FOR STATED YEARS

Crops	1973	1978*
Soybeans	64,000	61,200
Rice	1,050	5,600
Sorghum	2,700	5,300
Wheat	7,500	14,000

* Acreage for 1978 crop, preliminary.

TABLE 2.--NUMBER OF LIVESTOCK AND POULTRY IN STATED YEARS

Livestock and poultry	1974	1979
Cattle and calves	54,500	46,000
Milk cows	1,400	1,000
Hogs and pigs	8,100	11,500
Chickens (Broilers)	9,602,000	10,104,000*

* The number of broilers in 1976.

TABLE 3.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-78 at Batesville, Arkansas]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	49.1	26.3	37.7	75	-1	25	3.27	1.46	4.81	5	2.7
February---	54.2	29.6	42.0	76	6	36	3.37	1.69	4.82	6	2.0
March------	62.6	37.5	50.0	84	15	151	4.76	2.40	6.80	7	.7
April------	74.2	47.6	61.0	88	26	335	4.68	2.03	6.93	7	.0
May--------	81.8	55.2	68.5	94	34	574	4.62	2.42	6.54	7	.0
June-------	89.4	63.1	76.3	100	46	789	3.35	1.24	5.10	5	.0
July-------	93.2	67.2	80.2	104	51	936	4.09	2.40	5.59	7	.0
August-----	91.9	65.2	78.6	104	50	887	3.49	1.93	4.86	6	.0
September--	85.3	58.8	72.1	99	39	663	4.38	1.43	6.80	5	.0
October----	75.6	46.2	61.0	92	26	349	2.67	.67	4.25	4	.0
November---	61.9	36.9	49.4	80	13	88	4.67	1.95	6.96	6	.7
December---	52.1	30.2	41.2	74	5	19	3.82	2.01	5.40	6	1.0
Yearly:											
Average--	72.6	47.0	59.8	---	---	---	---	---	---	---	---
Extreme--	---	---	---	106	-1	---	---	---	---	---	---
Total----	---	---	---	---	---	4,852	47.17	37.25	55.97	71	7.1

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 4.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-78 at Batesville, Arkansas]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 6	April 18	April 28
2 years in 10 later than--	March 31	April 13	April 23
5 years in 10 later than--	March 20	April 4	April 13
First freezing temperature in fall:			
1 year in 10 earlier than--	October 27	October 20	October 10
2 years in 10 earlier than--	November 1	October 24	October 14
5 years in 10 earlier than--	November 11	November 1	October 21

TABLE 5.--GROWING SEASON

[Recorded in the period 1951-78 at Batesville, Arkansas]

Probability	Length of growing season if daily minimum temperature is--		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	213	191	175
8 years in 10	220	198	180
5 years in 10	235	210	191
2 years in 10	250	223	201
1 year in 10	257	229	207

TABLE 6.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1	Amagon silt loam, frequently flooded	26,050	5.4
2	Arkana-Moko complex, 3 to 8 percent slopes	8,150	1.7
3	Arrington silt loam, gently undulating	16,430	3.4
4	Askew silt loam, gently undulating	8,120	1.7
5	Boden fine sandy loam, 3 to 8 percent slopes	3,740	0.8
6	Boden fine sandy loam, 8 to 12 percent slopes	8,100	1.7
7	Boden stony fine sandy loam, 8 to 20 percent slopes	450	0.1
8	Brockwell fine sandy loam, 3 to 8 percent slopes	1,690	0.3
9	Captina silt loam, 1 to 3 percent slopes	610	0.1
10	Captina silt loam, 3 to 8 percent slopes	10,180	2.1
11	Clarksville very cherty silt loam, 3 to 8 percent slopes	1,980	0.4
12	Clarksville very cherty silt loam, 8 to 20 percent slopes	8,250	1.7
13	Clarksville very cherty silt loam, 20 to 40 percent slopes	53,520	11.0
14	Clarksville-Udorthents complex, 20 to 40 percent slopes	1,925	0.4
15	Crowley silt loam, 0 to 1 percent slopes	5,675	1.2
16	Dubbs silt loam, gently undulating	2,100	0.4
17	Egam silt loam, 0 to 1 percent slopes	20,380	4.2
18	Egam silty clay loam, occasionally flooded	2,315	0.5
19	Enders fine sandy loam, 3 to 8 percent slopes	2,845	0.6
20	Enders fine sandy loam, 8 to 12 percent slopes	4,725	1.0
21	Enders stony fine sandy loam, 8 to 20 percent slopes	11,000	2.3
22	Enders stony fine sandy loam, 20 to 45 percent slopes	24,380	5.0
23	Foley silt loam, 0 to 1 percent slopes	435	0.1
24	Forestdale silt loam, frequently flooded	7,740	1.6
25	Gepp very cherty silt loam, 3 to 8 percent slopes	2,970	0.6
26	Gepp very cherty silt loam, 8 to 12 percent slopes	7,750	1.6
27	Gepp very cherty silt loam, 12 to 30 percent slopes	8,726	1.8
28	Hontas silt loam, occasionally flooded	5,860	1.2
29	Jackport silty clay loam, 0 to 1 percent slopes	5,305	1.1
30	Lily fine sandy loam, 3 to 8 percent slopes	3,610	0.7
31	Lily fine sandy loam, 8 to 12 percent slopes	4,200	0.9
32	Lily-Ramsey-Rock outcrop complex, 8 to 30 percent slopes	10,790	2.2
33	Linker fine sandy loam, 3 to 8 percent slopes	19,370	4.0
34	Linker fine sandy loam, 8 to 12 percent slopes	4,365	0.9
35	Linker gravelly fine sandy loam, 3 to 8 percent slopes	13,760	2.8
36	Linker gravelly fine sandy loam, 8 to 12 percent slopes	22,110	4.5
37	Linker gravelly fine sandy loam, 12 to 30 percent slopes	14,590	3.0
38	Loring silt loam, 1 to 3 percent slopes	2,700	0.6
39	Loring silt loam, 3 to 8 percent slopes	16,510	3.4
40	Loring silt loam, 8 to 12 percent slopes	3,980	0.8
41	Moko-Rock outcrop complex, 3 to 20 percent slopes	3,455	0.7
42	Mountainburg stony fine sandy loam, 3 to 12 percent slopes	7,590	1.5
43	Newnata silty clay loam, 3 to 8 percent slopes	5,605	1.1
44	Newnata silty clay loam, 8 to 12 percent slopes	4,280	0.9
45	Noark very cherty silt loam, 3 to 8 percent slopes	930	0.2
46	Noark very cherty silt loam, 8 to 12 percent slopes	1,600	0.3
47	Noark very cherty silt loam, 12 to 30 percent slopes	1,515	0.3
48	Peridge silt loam, 3 to 8 percent slopes	3,235	0.7
49	Pits-Dumps complex, 20 to 40 percent slopes	240	*
50	Portia fine sandy loam, 3 to 8 percent slopes	8,890	1.8
51	Portia fine sandy loam, 8 to 12 percent slopes	3,750	0.8
52	Saffell gravelly fine sandy loam, 8 to 12 percent slopes	4,750	1.0
53	Saffell gravelly fine sandy loam, 12 to 20 percent slopes	3,560	0.7
54	Secesh silt loam, frequently flooded	5,510	1.1
55	Sidon silt loam, 1 to 3 percent slopes	850	0.2
56	Sidon silt loam, 3 to 8 percent slopes	27,780	5.7
57	Sidon silt loam, 8 to 12 percent slopes	2,310	0.5
58	Spadra fine sandy loam, 0 to 1 percent slopes	2,750	0.6
59	Sturkie silt loam, frequently flooded	1,205	0.2
60	Taft silt loam, 0 to 2 percent slopes	320	0.1
61	Wallen gravelly silt loam, 3 to 8 percent slopes	2,480	0.5
62	Wallen gravelly silt loam, 8 to 12 percent slopes	2,650	0.5
63	Wallen gravelly silt loam, 12 to 30 percent slopes	5,065	1.0
64	Wideman loamy fine sand, frequently flooded	3,510	0.7
	Water**	5,184	1.1
	Total	486,400	100.0

* Less than 0.1 percent.

** Areas of water more than 40 acres in size, and streams, sloughs, and canals more than one-eighth of a statute mile in width.

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Soybeans	Rice	Wheat	Grain sorghum	Tall fescue	Common bermudagrass
	Bu	Bu	Bu	Bu	AUM*	AUM*
1---------- Amagon	30	110	---	---	6.0	7.0
2---------- Arkana-Moko	---	---	---	---	4.0	---
3---------- Arrington	40	---	40	70	9.0	9.0
4---------- Askew	35	---	40	70	9.0	9.0
5---------- Boden	20	---	25	---	5.0	5.0
6---------- Boden	---	---	---	---	4.5	4.5
7---------- Boden	---	---	---	---	4.0	4.0
8---------- Brockwell	20	---	30	---	6.0	6.0
9---------- Captina	25	30	30	---	8.0	8.0
10---------- Captina	20	---	25	---	7.0	7.0
11---------- Clarksville	---	---	---	---	4.0	---
12, 13---------- Clarksville	---	---	---	---	3.0	---
14---------- Clarksville-Udorthents	---	---	---	---	---	---
15---------- Crowley	30	130	---	70	6.0	5.5
16---------- Dubbs	40	---	45	70	9.0	9.0
17---------- Egam	40	120	40	70	9.0	9.0
18---------- Egam	40	120	35	70	8.0	8.0
19---------- Enders	---	---	25	---	5.0	5.0
20---------- Enders	---	---	---	---	4.5	4.5
21, 22---------- Enders	---	---	---	---	---	---
23---------- Foley	30	120	35	60	8	6

See footnote at end of table.

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Soybeans	Rice	Wheat	Grain sorghum	Tall fescue	Common bermudagrass
	Bu	Bu	Bu	Bu	AUM*	AUM*
24--Forestdale	30	120	---	---	4.0	5.0
25--Gepp	---	---	30	---	5.5	6.5
26--Gepp	---	---	---	---	5.0	5.5
27--Gepp	---	---	---	---	4.0	4.0
28--Hontas	35	---	40	60	9.0	9.0
29--Jackport	35	130	---	60	8.0	7.0
30--Lily	20	---	35	---	6.0	6.0
31--Lily	---	---	30	---	5.5	5.5
32--Lily-Ramsey-Rock outcrop	---	---	---	---	---	---
33--Linker	20	---	30	---	6.0	6.0
34--Linker	---	---	25	---	5.5	5.5
35--Linker	20	---	30	---	6.0	6.0
36--Linker	---	---	25	---	5.5	5.5
37--Linker	---	---	---	---	4.5	4.5
38--Loring	30	---	40	65	8.0	8.0
39--Loring	25	---	35	60	7.0	7.0
40--Loring	---	---	30	---	6.5	6.5
41--Moko-Rock outcrop	---	---	---	---	---	---
42--Mountainburg	---	---	---	---	3.0	4.0
43--Newnata	---	---	25	---	5.0	5.0
44--Newnata	---	---	20	---	4.5	4.5
45--Noark	---	---	---	---	5.0	5.0

See footnote at end of table.

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Soybeans	Rice	Wheat	Grain sorghum	Tall fescue	Common bermuda-grass
	Bu	Bu	Bu	Bu	AUM*	AUM*
46--Noark	---	---	---	---	4.5	4.5
47--Noark	---	---	---	---	4.0	4.0
48--Peridge	25	---	35	---	7.5	7.0
49--Pits-Dumps	---	---	---	---	---	---
50--Portia	---	---	35	---	7.0	7.0
51--Portia	---	---	30	---	6.0	6.0
52--Saffell	---	---	---	---	---	3.5
53--Saffell	---	---	---	---	---	3.0
54--Secesh	---	---	---	---	6.0	6.0
55--Sidon	30	---	40	---	5.5	6.5
56--Sidon	25	---	35	---	5.0	6.0
57--Sidon	---	---	30	---	4.5	5.5
58--Spadra	30	---	40	---	9.0	8.0
59--Sturkie	30	---	---	---	7.0	7.0
60--Taft	25	---	30	---	6.0	6.0
61--Wallen	---	---	---	---	5.5	5.0
62--Wallen	---	---	---	---	5.0	4.5
63--Wallen	---	---	---	---	---	---
64--Wideman	---	---	---	---	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Woodland suitability group	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
1---------- Amagon	1w6	Slight	Severe	Moderate	Eastern cottonwood-----	100	Eastern cottonwood, cherrybark oak, Nuttall oak, Shumard oak, water oak, willow oak, sweetgum, American sycamore.
					Water oak----------	100	
					Willow oak----------	100	
					Cherrybark oak---------	90	
					Nuttall oak----------	100	
					Green ash----------	80	
					Sweetgum----------	100	
2*:							
Arkana----------	5c8	Slight	Moderate	Moderate	Shortleaf pine---------	55	Shortleaf pine, eastern redcedar.
					Southern red oak-------	55	
					Eastern redcedar-------	35	
					White oak----------	---	
Moko----------	5x3	Moderate	Severe	Moderate	Eastern redcedar-------	30	Eastern redcedar.
3---------- Arrington	2o7	Slight	Slight	Slight	White oak----------	80	Black walnut, loblolly pine, shortleaf pine.
					Southern red oak-------	80	
					Loblolly pine----------	90	
					Black walnut----------	---	
4---------- Askew	2o7	Slight	Slight	Slight	Eastern cottonwood-----	100	Eastern cottonwood, Nuttall oak, cherrybark oak, water oak, American sycamore.
					Cherrybark oak---------	90	
					Water oak----------	90	
					Willow oak----------	90	
					Nuttall oak----------	90	
					Sweetgum----------	90	
5, 6---------- Boden	4o7	Slight	Slight	Slight	Southern red oak-------	65	Shortleaf pine, loblolly pine, eastern redcedar, black walnut, black locust, southern red oak.
					Eastern redcedar-------	40	
					Black walnut----------	---	
					Shortleaf pine---------	60	
					Black locust----------	---	
					White oak----------	---	
					Black cherry----------	---	
					Loblolly pine----------	---	
7---------- Boden	4x8	Moderate	Moderate	Slight	Southern red oak-------	65	Shortleaf pine, loblolly pine, eastern redcedar.
					Eastern redcedar-------	40	
					Black walnut----------	---	
					Shortleaf pine---------	60	
					Black locust----------	---	
					White oak----------	---	
					Black cherry----------	---	
8---------- Brockwell	3o7	Slight	Slight	Slight	Shortleaf pine---------	70	Shortleaf pine, loblolly pine.
					Southern red oak-------	65	
					Black oak----------	---	
					White oak----------	---	
9, 10---------- Captina	4o7	Slight	Slight	Slight	Shortleaf pine---------	60	Shortleaf pine, eastern redcedar, black walnut, black locust, southern red oak.
					Southern red oak-------	65	
					Eastern redcedar-------	40	
					Black locust----------	---	
					Black walnut----------	---	
11---------- Clarksville	4f8	Slight	Slight	Moderate	White oak----------	55	White oak, shortleaf pine, sweetgum, green ash.
					Shortleaf pine---------	---	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
12---------- Clarksville	4f8	Slight	Moderate	Moderate	White oak---------- Shortleaf pine---------	55 ---	White oak, shortleaf pine, sweetgum, green ash.
13---------- Clarksville	4f9	Moderate	Severe	Severe	White oak---------- Shortleaf pine---------	55 ---	White oak, shortleaf pine, sweetgum, green ash.
14*: Clarksville------- Udorthents.	4f9	Moderate	Severe	Severe	White oak---------- Shortleaf pine---------	55 ---	White oak, shortleaf pine, sweetgum, green ash.
15---------- Crowley	3w9	Slight	Severe	Moderate	Loblolly pine---------- Shortleaf pine---------	83 ---	Loblolly pine.
16---------- Dubbs	2o4	Slight	Slight	Slight	Cherrybark oak--------- Eastern cottonwood----- Green ash---------- Nuttall oak---------- Shumard oak---------- Sweetgum---------- Water oak---------- Willow oak----------	100 100 80 95 100 95 90 95	Eastern cottonwood, green ash, Nuttall oak, sweetgum, American sycamore.
17, 18---------- Egam	2o4	Slight	Slight	Slight	Black walnut---------- Southern red oak------- Water oak----------	--- 90 90	Yellow-poplar, black walnut, loblolly pine.
19, 20---------- Enders	4o1	Slight	Slight	Slight	Southern red oak------- White oak----------	60 55	Loblolly pine, shortleaf pine.
21---------- Enders	4x2	Slight	Moderate	Slight	Southern red oak------- White oak---------- Eastern redcedar------- Shortleaf pine---------	60 55 40 60	Loblolly pine, shortleaf pine, eastern redcedar.
22---------- Enders	5r3	Moderate	Severe	Moderate	Southern red oak------- White oak---------- Eastern redcedar------- Shortleaf pine---------	50 50 35 50	Loblolly pine, shortleaf pine, eastern redcedar.
23---------- Foley	3w6	Slight	Severe	Moderate	Sweetgum---------- Cherrybark oak--------- Water oak----------	80 80 80	Sweetgum, American sycamore.
24---------- Forestdale	1w6	Slight	Severe	Moderate	Green ash---------- Eastern cottonwood----- Cherrybark oak--------- Nuttall oak---------- Water oak---------- Willow oak---------- Sweetgum----------	78 100 94 99 90 94 100	Green ash, eastern cottonwood, Nuttall oak, sweetgum, American sycamore.
25, 26, 27--------- Gepp	3o7	Slight	Slight	Slight	White oak---------- Shortleaf pine--------- Loblolly pine---------- Black oak---------- Northern red oak-------	70 75 80 70 70	Black walnut, loblolly pine, shortleaf pine.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
28---------- Hontas	2o7	Slight	Slight	Slight	Shortleaf pine--------- Shumard oak---------- Sweetgum---------- Eastern cottonwood----- American sycamore------ Black walnut---------- Water oak----------	80 80 80 80 75 --- ---	Shortleaf pine, black walnut, loblolly pine, eastern cottonwood, American sycamore, Shumard oak, sweetgum.
29---------- Jackport	2w6	Slight	Severe	Moderate	Green ash---------- Cherrybark oak--------- Water oak---------- Willow oak---------- Sweetgum----------	80 90 90 90 90	Green ash, eastern cottonwood, Nuttall oak, willow oak, sweetgum, American sycamore.
30, 31---------- Lily	4o7	Slight	Slight	Slight	Shortleaf pine---------	63 65	Loblolly pine, shortleaf pine.
32*: Lily----------	4r8	Moderate	Moderate	Slight	Shortleaf pine---------	63	Loblolly pine, shortleaf pine.
Ramsey----------	4d2	Slight	Slight	Severe	White oak---------- Shortleaf pine--------- Loblolly pine---------- Eastern redcedar-------	61 59 73 ---	Shortleaf pine, loblolly pine.
Rock outcrop.							
33, 34, 35, 36, 37- Linker	4o7	Slight	Slight	Slight	Shortleaf pine--------- Southern red oak------- White oak---------- Eastern redcedar------- Loblolly pine----------	60 50 50 40 ---	Shortleaf pine, loblolly pine, eastern redcedar.
38, 39, 40--------- Loring	3o7	Slight	Slight	Slight	Cherrybark oak--------- Sweetgum---------- Southern red oak------- Loblolly pine---------- Water oak----------	86 90 74 85 82	Loblolly pine, southern red oak.
41*: Moko----------	5x3	Moderate	Severe	Moderate	Eastern redcedar-------	30	Eastern redcedar.
Rock outcrop.							
42---------- Mountainburg	5x3	Slight	Severe	Moderate	Shortleaf pine--------- Eastern redcedar------- Loblolly pine----------	50 30 ---	Shortleaf pine, eastern redcedar, loblolly pine.
43, 44---------- Newnata	4o7	Slight	Slight	Slight	Northern red oak------- Eastern redcedar------- Common hackberry------- Shortleaf pine--------- Black locust---------- White oak---------- Green ash---------- Blackgum---------- Shagbark hickory-------	65 40 --- 60 --- --- --- --- ---	Northern red oak, white oak, eastern redcedar.
45, 46---------- Noark	4f8	Slight	Moderate	Moderate	Shortleaf pine--------- Eastern redcedar------- Southern red oak------- White oak----------	60 40 60 ---	Shortleaf pine, eastern redcedar, southern red oak.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
47---------- Noark	4r9	Moderate	Severe	Moderate	Shortleaf pine--------- Eastern redcedar------- Southern red oak------- White oak----------	60 40 60 ---	Shortleaf pine, eastern redcedar, southern red oak.
48---------- Peridge	3o7	Slight	Slight	Slight	Shortleaf pine--------- Southern red oak------- Eastern redcedar------- Black walnut---------- White oak---------- White ash---------- Black cherry---------- Black locust----------	70 70 50 --- --- --- --- ---	Shortleaf pine, loblolly pine, black walnut, black locust, southern red oak, white ash, eastern redcedar.
50, 51---------- Portia	3o7	Slight	Slight	Slight	Sweetgum---------- Loblolly pine----------	80 75	Loblolly pine, shortleaf pine.
52---------- Saffell	4f2	Slight	Slight	Moderate	Loblolly pine--------- Shortleaf pine--------- Eastern redcedar-------	70 60 ---	Loblolly pine, shortleaf pine, eastern redcedar.
53---------- Saffell	4f2	Slight	Slight	Moderate	Loblolly pine--------- Shortleaf pine--------- Eastern redcedar-------	70 60 ---	Loblolly pine, shortleaf pine, eastern redcedar.
54---------- Secesh	4o7	Slight	Slight	Slight	White oak---------- Shortleaf pine--------- American sycamore------ Black walnut---------- Black oak----------	60 --- --- --- ---	Black walnut, shortleaf pine, American sycamore, loblolly pine.
55, 56, 57--------- Sidon	3o7	Slight	Slight	Slight	Northern red oak------- White oak---------- Shortleaf pine---------	--- --- ---	Loblolly pine, shortleaf pine.
58---------- Spadra	2o7	Slight	Slight	Slight	Shortleaf pine--------- Southern red oak------- Eastern redcedar-------	80 80 60	Loblolly pine, shortleaf pine, black walnut, black locust, southern red oak, eastern redcedar.
59---------- Sturkie	2o4	Slight	Slight	Slight	Southern red oak------- White oak---------- American sycamore------ Eastern cottonwood-----	80 70 80 100	Northern red oak, white oak, American sycamore, eastern cottonwood, black walnut.
60---------- Taft	3w8	Slight	Moderate	Moderate	White oak---------- Loblolly pine---------- Sweetgum---------- Shortleaf pine---------	60 85 80 60	Loblolly pine.
61, 62---------- Wallen	4f8	Slight	Slight	Moderate	Northern red oak------- Shortleaf pine---------	60 60	Loblolly pine, shortleaf pine.
63---------- Wallen	4f9	Moderate	Severe	Severe	Northern red oak------- Shortleaf pine---------	60 60	Loblolly pine, shortleaf pine.
64---------- Wideman	3s8	Slight	Moderate	Moderate	Sweetgum---------- Eastern cottonwood----- American sycamore------	80 90 80	Eastern cottonwood, American sycamore, loblolly pine, shortleaf pine, sweetgum.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
1---------- Amagon	Severe: flooding, wetness.	Moderate: flooding, wetness, percs slowly.	Severe: wetness, flooding.	Moderate: wetness, flooding.
2*: Arkana----------	Severe: percs slowly.	Severe: percs slowly.	Severe: small stones, percs slowly.	Slight.
Moko----------	Severe: depth to rock.	Severe: depth to rock.	Severe: large stones, small stones.	Severe: large stones.
3---------- Arrington	Slight----------	Slight----------	Slight----------	Slight.
4---------- Askew	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
5---------- Boden	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight.
6---------- Boden	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight.
7---------- Boden	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Moderate: large stones.
8---------- Brockwell	Slight----------	Slight----------	Moderate: slope.	Slight.
9, 10---------- Captina	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight.
11---------- Clarksville	Severe: small stones.	Severe: small stones.	Severe: small stones.	Severe: small stones.
12---------- Clarksville	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Severe: small stones.
13---------- Clarksville	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.
14*: Clarksville----------	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.
Udorthents.				
15---------- Crowley	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
16--- Dubbs	Slight	Slight	Slight	Slight.
17--- Egam	Severe: flooding.	Moderate: percs slowly.	Moderate: percs slowly.	Slight.
18--- Egam	Severe: flooding.	Moderate: percs slowly.	Moderate: flooding, percs slowly.	Slight.
19--- Enders	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.
20--- Enders	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.
21--- Enders	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, small stones, percs slowly.	Severe: erodes easily.
22--- Enders	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, small stones, percs slowly.	Severe: slope, erodes easily.
23--- Foley	Severe: wetness, percs slowly.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly, excess sodium.	Severe: wetness.
24--- Forestdale	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: flooding, wetness, percs slowly.	Severe: wetness, erodes easily.
25--- Gepp	Severe: small stones.	Severe: small stones.	Severe: small stones.	Severe: small stones.
26--- Gepp	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Severe: small stones.
27--- Gepp	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones.
28--- Hontas	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Slight.
29--- Jackport	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.
30--- Lily	Slight	Slight	Moderate: slope, depth to rock.	Slight.
31--- Lily	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
32*: Lily---	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
32*: Ramsey	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.
Rock outcrop.				
33--- Linker	Slight	Slight	Moderate: slope, small stones.	Slight.
34--- Linker	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
35--- Linker	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
36--- Linker	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
37--- Linker	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
38, 39--- Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight.
40--- Loring	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.
41*: Moko	Severe: depth to rock.	Severe: depth to rock.	Severe: large stones, slope, small stones.	Severe: large stones.
Rock outcrop.				
42--- Mountainburg	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: large stones.
43--- Newnata	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Severe: erodes easily.
44--- Newnata	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.
45--- Noark	Severe: small stones.	Severe: small stones.	Severe: small stones.	Severe: small stones.
46--- Noark	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Severe: small stones.
47--- Noark	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones.
48--- Peridge	Slight	Slight	Moderate: slope.	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
49*: Pits. Dumps.				
50 Portia	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight.
51 Portia	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight.
52 Saffell	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
53 Saffell	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
54 Secesh	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.
55, 56 Sidon	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: slope, percs slowly, wetness.	Slight.
57 Sidon	Moderate: percs slowly, slope, wetness.	Moderate: percs slowly, slope, wetness.	Severe: slope.	Severe: erodes easily.
58 Spadra	Slight	Slight	Slight	Slight.
59 Sturkie	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.
60 Taft	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.
61 Wallen	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
62 Wallen	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
63 Wallen	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
64 Wideman	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
1---------- Amagon	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
2*: Arkana----------	Fair	Good	Fair	Good	---	Poor	Very poor.	Fair	Good	Very poor.
Moko----------	Very poor.	Poor	Poor	---	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
3---------- Arrington	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
4---------- Askew	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor.
5---------- Boden	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
6---------- Boden	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
7---------- Boden	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
8---------- Brockwell	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
9---------- Captina	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
10---------- Captina	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
11, 12---------- Clarksville	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
13---------- Clarksville	Very poor.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
14*: Clarksville-------	Very poor.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Udorthents.										
15---------- Crowley	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
16---------- Dubbs	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
17, 18---------- Egam	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
19, 20---------- Enders	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
21---------- Enders	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
22---------- Enders	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
23---------- Foley	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
24---------- Forestdale	Poor	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
25, 26---------- Gepp	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
27---------- Gepp	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
28---------- Hontas	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
29---------- Jackport	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
30---------- Lily	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
31---------- Lily	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
32*: Lily----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Ramsey----------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Rock outcrop.										
33---------- Linker	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
34---------- Linker	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
35---------- Linker	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
36---------- Linker	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
37---------- Linker	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
38---------- Loring	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
39, 40---------- Loring	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
41*: Moko----------	Very poor.	Poor	Poor	---	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
42---------- Mountainburg	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Poor	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
43---- Newnata	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
44---- Newnata	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
45, 46---- Noark	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
47---- Noark	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
48---- Peridge	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
49*: Pits.										
Dumps.										
50---- Portia	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
51---- Portia	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
52---- Saffell	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
53---- Saffell	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
54---- Secesh	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
55---- Sidon	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
56, 57---- Sidon	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
58---- Spadra	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
59---- Sturkie	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
60---- Taft	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
61, 62, 63---- Wallen	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
64---- Wideman	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
1. Amagon	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, wetness.
2*: Arkana	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
Moko	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.
3 Arrington	Moderate: too clayey.	Slight	Slight	Slight	Moderate: low strength.
4 Askew	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.
5 Boden	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.
6, 7 Boden	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.
8 Brockwell	Slight	Slight	Slight	Moderate: slope.	Slight.
9 Captina	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.
10 Captina	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness.
11 Clarksville	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Slight.
12 Clarksville	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
13 Clarksville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
14*: Clarksville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Udorthents.					
15 Crowley	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.
16 Dubbs	Slight	Slight	Slight	Slight	Slight.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
17--Egam	Moderate: too clayey, wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength.
18--Egam	Moderate: too clayey, wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.
19--Enders	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
20, 21--Enders	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
22--Enders	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
23--Foley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.
24--Forestdale	Severe: wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, shrink-swell, wetness.
25--Gepp	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.
26--Gepp	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.
27--Gepp	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
28--Hontas	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
29--Jackport	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.
30--Lily	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.
31--Lily	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.
32*: Lily	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
Ramsey	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
32*: Rock outcrop.					
33---- Linker	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.
34---- Linker	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.
35---- Linker	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.
36---- Linker	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.
37---- Linker	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
38---- Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.
39---- Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.
40---- Loring	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.
41*: Moko----	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: depth to rock, large stones.
Rock outcrop.					
42---- Mountainburg	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.
43---- Newnata	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
44---- Newnata	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: slope, shrink-swell.	Severe: low strength, shrink-swell.
45---- Noark	Moderate: too clayey.	Slight----	Slight----	Moderate: slope.	Slight.
46---- Noark	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
47---- Noark	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
48---- Peridge	Moderate: too clayey.	Slight----	Slight----	Moderate: slope.	Severe: low strength.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
49*: Pits. Dumps.					
50--- Portia	Slight	Slight	Slight	Moderate: slope.	Slight.
51--- Portia	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
52--- Saffell	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
53--- Saffell	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
54--- Secesh	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
55--- Sidon	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.
56--- Sidon	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: low strength, wetness.
57--- Sidon	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Moderate: low strength, slope, wetness.
58--- Spadra	Slight	Slight	Slight	Slight	Slight.
59--- Sturkie	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
60--- Taft	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.
61--- Wallen	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Moderate: depth to rock.
62--- Wallen	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.
63--- Wallen	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
64--- Wideman	Severe: flooding, cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1---------- Amagon	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
2*: Arkana----------	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Moko----------	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock.	Poor: area reclaim, thin layer.
3---------- Arrington	Moderate: percs slowly.	Moderate: seepage.	Slight----------	Slight----------	Fair: thin layer.
4---------- Askew	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
5---------- Boden	Severe: percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
6, 7---------- Boden	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
8---------- Brockwell	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
9, 10---------- Captina	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, wetness.	Severe: depth to rock.	Moderate: depth to rock.	Fair: area reclaim, small stones.
11---------- Clarksville	Slight----------	Severe: seepage.	Severe: seepage, too clayey.	Severe: seepage.	Poor: too clayey, small stones.
12---------- Clarksville	Moderate: slope.	Severe: seepage, slope.	Severe: seepage, too clayey.	Severe: seepage.	Poor: too clayey, small stones.
13---------- Clarksville	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, too clayey.	Severe: seepage, slope.	Poor: too clayey, small stones, slope.
14*: Clarksville-------- Udorthents.	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, too clayey.	Severe: seepage, slope.	Poor: too clayey, small stones, slope.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
15--Crowley	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
16--Dubbs	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
17--Egam	Severe: wetness, percs slowly.	Severe: flooding, wetness.	Severe: wetness, too clayey.	Moderate: flooding, wetness.	Poor: too clayey, hard to pack.
18--Egam	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding.	Poor: too clayey, hard to pack.
19--Enders	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
20, 21--Enders	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
22--Enders	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
23--Foley	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, excess sodium.	Severe: wetness.	Poor: hard to pack, wetness, excess sodium.
24--Forestdale	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
25--Gepp	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
26--Gepp	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
27--Gepp	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
28--Hontas	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
29--Jackport	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
30--Lily	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
31---------- Lily	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim.
32*: Lily----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.
Ramsey---------- Rock outcrop.	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.
33---------- Linker	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
34---------- Linker	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
35---------- Linker	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
36---------- Linker	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
37---------- Linker	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, slope, thin layer.
38, 39---------- Loring	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
40---------- Loring	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: slope, wetness.
41*: Moko----------	Severe: depth to rock, large stones.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock.	Poor: area reclaim, thin layer.
Rock outcrop.					
42---------- Mountainburg	Severe: depth to rock, large stones.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, small stones, thin layer.
43---------- Newnata	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
44---------- Newnata	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
31---------- Lily	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim.
32*: Lily----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.
Ramsey----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.
Rock outcrop.					
33---------- Linker	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
34---------- Linker	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
35---------- Linker	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
36---------- Linker	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
37---------- Linker	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, slope, thin layer.
38, 39---------- Loring	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
40---------- Loring	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: slope, wetness.
41*: Moko----------	Severe: depth to rock, large stones.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock.	Poor: area reclaim, thin layer.
Rock outcrop.					
42---------- Mountainburg	Severe: depth to rock, large stones.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, small stones, thin layer.
43---------- Newnata	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
44---------- Newnata	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
45---------- Noark	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight----------	Poor: too clayey, small stones.
46---------- Noark	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, small stones.
47---------- Noark	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, small stones, slope.
48---------- Peridge	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey, thin layer.
49*: Pits.					
Dumps.					
50---------- Portia	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
51---------- Portia	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
52---------- Saffell	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Poor: small stones.
53---------- Saffell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.
54---------- Secesh	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Fair: small stones, thin layer.
55, 56---------- Sidon	Severe: percs slowly, wetness.	Severe: wetness.	Severe: depth to rock.	Moderate: wetness, depth to rock.	Fair: area reclaim, too clayey.
57---------- Sidon	Severe: percs slowly, wetness.	Severe: slope, wetness.	Severe: depth to rock.	Moderate: slope, depth to rock, wetness.	Fair: area reclaim, slope, too clayey.
58---------- Spadra	Moderate: percs slowly.	Moderate: seepage.	Slight----------	Slight----------	Good.
59---------- Sturkie	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
60---------- Taft	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
61---------- Wallen	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, small stones.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
62---------- Wallen	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, small stones.
63---------- Wallen	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, small stones, slope.
64---------- Wideman	Severe: flooding.	Severe: flooding, seepage.	Severe: seepage, flooding.	Severe: flooding, seepage.	Poor: seepage.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1---------- Amagon	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
2*: Arkana----------	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Moko----------	Poor: area reclaim, large stones, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, large stones, thin layer.
3---------- Arrington	Fair: low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Good.
4---------- Askew	Poor: low strength.	Probable----------	Improbable: too sandy.	Good.
5, 6---------- Boden	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
7---------- Boden	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, thin layer.
8---------- Brockwell	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
9, 10---------- Captina	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
11, 12---------- Clarksville	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
13---------- Clarksville	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
14*: Clarksville----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Udorthents.				
15---------- Crowley	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
16---------- Dubbs	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
17, 18---------- Egam	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
19, 20, 21---------- Enders	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
22--- Enders	Poor: low strength, slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, thin layer.
23--- Foley	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
24--- Forestdale	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, thin layer.
25, 26--- Gepp	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
27--- Gepp	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
28--- Hontas	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
29--- Jackport	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
30, 31--- Lily	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
32*: Lily---	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Ramsey---	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Rock outcrop.				
33, 34, 35, 36--- Linker	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
37--- Linker	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
38, 39--- Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
40--- Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
41*: Moko---	Poor: area reclaim, large stones, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, large stones, thin layer.
Rock outcrop.				
42--- Mountainburg	Poor: area reclaim, large stones, thin layer.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones, thin layer.
43--- Newnata	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
44--- Newnata	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
45, 46--- Noark	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
47--- Noark	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
48--- Peridge	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
49*: Pits.				
Dumps.				
50--- Portia	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
51--- Portia	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
52--- Saffell	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
53--- Saffell	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
54--- Secesh	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
55, 56, 57--- Sidon	Fair: thin layer, wetness, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
58--- Spadra	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
59--- Sturkie	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
60--- Taft	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
61, 62--- Wallen	Poor: area reclaim.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, small stones.
63--- Wallen	Poor: area reclaim.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, small stones, slope.
64--- Wideman	Good	Improbable: thin layer.	Improbable: too sandy.	Fair: too sandy.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
1---------- Amagon	Slight----------	Moderate: piping, wetness.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Erodes easily	Wetness, percs slowly.
2*: Arkana----------	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Droughty, percs slowly, depth to rock.	Large stones, depth to rock.	Large stones, depth to rock.
Moko----------	Severe: depth to rock.	Severe: large stones.	Deep to water	Large stones, droughty, depth to rock.	Large stones, depth to rock.	Large stones, droughty, depth to rock.
3---------- Arrington	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
4---------- Askew	Severe: seepage.	Severe: piping.	Favorable------	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
5---------- Boden	Moderate: seepage, depth to rock.	Moderate: thin layer.	Deep to water	Slope----------	Favorable------	Favorable.
6---------- Boden	Moderate: seepage, depth to rock.	Moderate: thin layer.	Deep to water	Slope----------	Slope----------	Slope.
7---------- Boden	Moderate: seepage, depth to rock.	Moderate: thin layer, large stones.	Deep to water	Slope----------	Slope----------	Large stones, slope.
8---------- Brockwell	Moderate: seepage.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
9---------- Captina	Moderate: seepage, depth to rock.	Severe: piping.	Percs slowly, depth to rock.	Wetness, percs slowly, depth to rock.	Erodes easily, depth to rock.	Erodes easily, depth to rock.
10---------- Captina	Moderate: seepage, depth to rock.	Severe: piping.	Percs slowly, depth to rock, slope.	Wetness, percs slowly, depth to rock.	Erodes easily, depth to rock.	Erodes easily, depth to rock.
11---------- Clarksville	Severe: seepage.	Moderate: large stones.	Deep to water	Droughty, slope.	Large stones---	Large stones, droughty.
12, 13---------- Clarksville	Severe: seepage, slope.	Moderate: large stones.	Deep to water	Droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
14*: Clarksville------	Severe: seepage, slope.	Moderate: large stones.	Deep to water	Droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
Udorthents.						
15---------- Crowley	Slight----------	Severe: wetness.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, percs slowly.
16---------- Dubbs	Severe: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
17---- Egam	Slight	Severe: hard to pack.	Deep to water	Favorable	Favorable	Favorable.
18---- Egam	Slight	Severe: hard to pack.	Deep to water, flooding.	Flooding	Favorable	Favorable.
19---- Enders	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
20---- Enders	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
21---- Enders	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
22---- Enders	Severe: slope.	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
23---- Foley	Slight	Severe: wetness, excess sodium.	Percs slowly, excess sodium.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium.
24---- Forestdale	Slight	Severe: wetness, piping.	Flooding, percs slowly.	Wetness, percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Percs slowly, wetness.
25---- Gepp	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope	Favorable	Favorable.
26, 27---- Gepp	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
28---- Hontas	Moderate: seepage.	Severe: piping.	Flooding	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Favorable.
29---- Jackport	Slight	Severe: hard to pack, wetness.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, percs slowly.
30---- Lily	Severe: seepage.	Severe: piping.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.
31---- Lily	Severe: seepage.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
32*:						
Lily----	Severe: seepage, slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
Ramsey----	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop.						
33---- Linker	Moderate: seepage, depth to rock.	Severe: piping.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.
34---- Linker	Moderate: seepage, depth to rock.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
35---- Linker	Moderate: seepage, depth to rock.	Severe: piping.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.
36---- Linker	Moderate: seepage, depth to rock.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
37---- Linker	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
38---- Loring	Moderate: seepage.	Moderate: piping.	Favorable----	Wetness, rooting depth.	Erodes easily, wetness.	Erodes easily, rooting depth.
39---- Loring	Moderate: seepage.	Moderate: piping.	Slope----	Wetness, rooting depth, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
40---- Loring	Moderate: seepage.	Moderate: piping.	Slope----	Wetness, rooting depth, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
41*: Moko----	Severe: depth to rock, slope.	Severe: large stones.	Deep to water	Large stones, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Rock outcrop.						
42---- Mountainburg	Severe: depth to rock, seepage.	Severe: large stones, thin layer.	Deep to water	Slope, large stones, depth to rock.	Large stones, depth to rock.	Large stones, droughty, depth to rock.
43---- Newnata	Moderate: depth to rock.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
44---- Newnata	Moderate: depth to rock.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
45---- Noark	Moderate: seepage.	Slight----	Deep to water	Droughty, slope.	Favorable----	Droughty.
46---- Noark	Moderate: seepage.	Slight----	Deep to water	Droughty, slope.	Slope----	Slope, droughty.
47---- Noark	Severe: slope.	Slight----	Deep to water	Droughty, slope.	Slope----	Slope, droughty.
48---- Peridge	Moderate: seepage.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
49*: Pits.						
Dumps.						
50---- Portia	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----	Favorable----	Favorable.
51---- Portia	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----	Slope----	Slope.
52, 53---- Saffell	Severe: seepage.	Slight----	Deep to water	Droughty, slope.	Slope----	Slope, droughty.
54---- Secesh	Severe: seepage.	Slight----	Deep to water	Flooding----	Large stones---	Favorable.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
55--Sidon	Moderate: depth to rock.	Severe: thin layer.	Percs slowly---	Percs slowly, rooting depth, wetness.	Wetness, rooting depth, erodes easily.	Percs slowly, erodes easily.
56--Sidon	Moderate: depth to rock.	Severe: thin layer.	Percs slowly, slope.	Slope, percs slowly, rooting depth.	Wetness, rooting depth, erodes easily.	Percs slowly, erodes easily.
57--Sidon	Moderate: depth to rock.	Severe: thin layer.	Percs slowly, slope.	Slope, percs slowly, rooting depth.	Rooting depth, erodes easily, slope.	Percs slowly, slope, erodes easily.
58--Spadra	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Favorable.
59--Sturkie	Moderate: seepage.	Severe: piping.	Deep to water	Flooding-------	Erodes easily	Favorable.
60--Taft	Moderate: seepage.	Severe: piping.	Percs slowly---	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
61--Wallen	Severe: seepage.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, depth to rock.	Large stones, depth to rock.	Large stones, droughty, depth to rock.
62--Wallen	Severe: seepage.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
63--Wallen	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
64--Wideman	Severe: seepage.	Severe: piping, seepage.	Deep to water	Flooding, fast intake.	Too sandy------	Droughty.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1---------- Amagon	0-6	Silt loam---------	ML, CL, CL-ML	A-4	0	100	100	85-100	85-100	<30	NP-10
	6-16	Silt loam---------	CL, CL-ML	A-4, A-6	0	100	100	85-100	85-100	25-40	7-18
	16-41	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	85-100	85-100	30-45	11-22
	41-72	Silt loam, loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	100	100	80-100	60-100	20-45	1-22
2*: Arkana----------	0-6	Cherty silt loam	SM, SC, SM-SC	A-4, A-2, A-6	0-25	60-90	55-80	50-75	25-45	<35	NP-15
	6-24	Clay, silty clay, cherty clay.	CH	A-7	0-10	70-100	70-100	65-95	60-85	51-80	31-50
	24-26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Moko----------	0-3	Very stony silt loam.	ML, CL, CL-ML,	A-4, A-6	35-75	65-90	50-72	45-70	40-60	18-38	3-15
	3-10	Very stony silt loam, very stony loam, very stony silty clay loam.	ML, CL CL-ML	A-4, A-6	35-75	65-90	50-72	45-70	40-60	18-38	3-15
	10-12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
3---------- Arrington	0-24	Silt loam---------	CL, ML, CL-ML	A-4, A-6	0	100	90-100	85-95	75-95	25-36	3-12
	24-72	Silt loam, silty clay loam, loam.	CL, ML	A-4, A-6, A-7	0	95-100	85-100	75-95	65-95	28-48	8-23
4---------- Askew	0-5	Silt loam---------	ML, CL	A-4	0	100	100	80-100	45-80	<20	NP-10
	5-42	Silty clay loam, silt loam, loam.	CL, ML ML-CL	A-6, A-4	0	100	100	90-100	70-90	25-40	6-20
	42-72	Loam, fine sandy loam, silt loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	100	100	65-100	25-90	20-40	1-20
5, 6---------- Boden	0-12	Fine sandy loam	ML, SM,	A-2, A-4	0	75-100	75-100	55-75	20-55	<20	NP
	12-22	Sandy clay loam, fine sandy loam.	ML, CL-ML, SM, SM-SC	A-2, A-4	0	85-100	85-100	75-90	30-60	<25	NP-7
	22-38	Sandy clay, clay	CH, CL	A-6, A-7	0	85-100	85-100	75-90	55-80	35-55	15-30
	38-44	Sandy clay loam, sandy clay.	CL, SC	A-4, A-6	0	80-95	75-95	65-90	35-70	25-40	10-20
	44-56	Sandy loam, sandy clay loam.	ML, CL, SM, SC	A-4	0	95-100	90-100	75-90	35-70	<30	NP-10
	56-58	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
7---------- Boden	0-3	Stony fine sandy loam.	SM, ML	A-2, A-4	10-30	75-100	75-100	65-75	20-50	<20	NP
	3-22	Sandy clay loam, fine sandy loam.	ML, CL-ML, SM, SM-SC	A-2, A-4	0-10	85-100	85-100	75-90	30-60	<25	NP-7
	22-38	Sandy clay, clay	CH, CL	A-6, A-7	0-10	85-100	85-100	75-90	55-80	35-55	15-30
	38-44	Sandy clay loam, sandy clay.	CL, SC	A-6, A-4	0-20	80-95	75-95	65-90	35-70	25-40	10-20
	44-56	Sandy loam, sandy clay loam.	ML, CL, SM, SC	A-4	0	95-100	90-100	75-90	35-70	<30	NP-10
	56-58	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
8---------- Brockwell	0-14	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4, A-2	0	95-100	75-100	60-95	30-60	<15	NP-5
	14-48	Fine sandy loam, loam, sandy clay loam.	SM, ML, CL-ML, SM-SC	A-4, A-2	0	95-100	75-100	50-95	30-60	<15	NP-5
	48-80	Fine sandy loam, loam, sandy clay loam.	SM, SM-SC	A-4, A-2	0	85-100	75-90	40-75	25-45	<25	NP-7

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
9, 10---------- Captina	0-6	Silt loam--------	ML, CL-ML	A-4	0	95-100	90-100	85-100	75-95	<35	NP-7
	6-24	Silty clay loam, silt loam.	CL-ML, CL	A-4, A-6, A-7	0	95-100	95-100	90-100	85-95	20-45	5-20
	24-50	Silty clay loam, silt loam, cherty silt loam.	CL, GM-GC, GC, CL-ML	A-4, A-6	0-20	60-100	55-100	45-100	45-95	20-40	5-20
	50-72	Very cherty silty clay loam, very cherty silt loam, weathered bedrock.	GC, GM GM-GC	A-2, A-4 A-6	75-85	60-95	55-90	45-90	45-85	20-40	5-15
11, 12, 13------- Clarksville	0-14	Very cherty silt loam.	GC, SC, SM-SC, GP-GC	A-2, A-1	5-20	30-70	10-60	5-50	5-35	20-40	5-15
	14-72	Very cherty silty clay loam, very cherty silty clay, very cherty silt loam.	GC, SC, SP-SC, GP-GC	A-2, A-6	5-20	30-70	10-60	10-50	5-45	30-40	15-25
14*: Clarksville-----	0-14	Very cherty silt loam.	GC, SC, SM-SC, GP-GC	A-2, A-2 A-1 A-1-A	5-20	30-70	10-60	5-50	5-35	20-40	5-15
	14-72	Very cherty silty clay loam, very cherty silty clay, very cherty silt loam.	GC, SC, SP-SC, GP-GC	A-2, A-6	5-20	30-70	10-60	10-50	5-45	30-40	15-25
Udorthents.											
15---------- Crowley	0-20	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	95-100	80-100	<30	NP-10
	20-40	Silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-100	41-60	20-35
	40-72	Silty clay loam, silty clay.	CL, CH	A-7, A-6	0	100	100	95-100	85-100	38-60	18-35
16---------- Dubbs	0-6	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	60-90	20-35	3-10
	6-50	Silty clay loam, silt loam, sandy clay loam.	CL, ML CL-ML	A-6, A-7 A-4	0	100	100	100	85-100	35-50	15-25
	50-72	Loam, silt loam, very fine sandy loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	85-95	55-90	20-35	3-14
17---------- Egam	0-7	Silt loam--------	CL, ML, CL-ML	A-6, A-7, A-4	0	95-100	95-100	85-100	75-95	21-45	4-20
	7-58	Silty clay, silty clay loam, clay.	CL, MH, CH	A-7, A-6	0	95-100	95-100	90-100	85-95	38-60	15-30
	58-72	Silty clay loam, silty clay.	CL, MH, CH	A-6, A-7,	0	95-100	95-100	75-100	55-95	25-60	8-30
18---------- Egam	0-7	Silty clay loam	CL, ML, CL-ML	A-6, A-7, A-4	0	95-100	95-100	85-100	75-95	21-45	4-20
	7-58	Silty clay, silty clay loam, clay.	CL, MH, CH	A-7, A-6	0	95-100	95-100	90-100	85-95	38-60	15-30
	58-72	Silty clay loam, silty clay.	CL, MH, CH	A-6, A-7	0	95-100	95-100	75-100	55-95	25-60	8-30

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
19, 20---------- Enders	0-8	Fine sandy loam	ML, SM, SM-SC, CL-ML	A-4	0	80-100	80-97	75-90	40-85	20-35	2-10
	8-58	Silty clay, silty clay loam, clay.	CH	A-7	0	95-100	85-100	85-100	70-95	65-80	35-45
	58-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
21, 22---------- Enders	0-10	Stony fine sandy loam.	SM, ML, SM-SC, CL-ML	A-4, A-2	20-40	80-90	70-80	65-75	30-60	20-35	2-10
	10-58	Silty clay loam, silty clay, clay.	CH	A-7	0	95-100	85-100	85-100	70-95	50-65	35-45
	58-60	Weathered bedrock, unweathered bedrock.	---	---	---	---	---	---	---	---	---
23---------- Foley	0-11	Silt loam---------	CL, CL-ML	A-4, A-6, A-7	0	100	100	95-100	70-100	25-45	5-20
	11-23	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-49	11-25
	23-54	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	90-100	40-60	18-32
	54-72	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	85-100	30-45	11-20
24---------- Forestdale	0-4	Silt loam---------	CL, CL-ML	A-4, A-6	0	100	100	95-100	80-95	<30	5-15
	4-56	Silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	90-100	40-65	20-40
	56-80	Silty clay loam, silt loam.	CL, CL-ML, CH	A-6, A-7, A-4	0	100	100	95-100	75-100	20-50	5-30
25, 26, 27------- Gepp	0-12	Very cherty silt loam.	GM, GC, SM-SC, SM	A-1, A-2	10-30	30-70	20-50	10-40	5-20	<30	NP-10
	12-23	Silty clay--------	MH, CH	A-7	0-5	90-100	90-100	85-100	80-95	51-75	25-40
	23-65	Clay, cherty clay	MH, CH	A-7	0-15	70-100	70-100	65-100	60-95	51-75	25-40
	65-70	Weathered bedrock.									
28---------- Hontas	0-12	Silt loam---------	ML, CL-ML	A-4	0	100	100	90-100	80-90	<25	NP-7
	12-72	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	85-95	20-35	5-15
29---------- Jackport	0-12	Silty clay loam	CL, CH	A-6, A-7	0	100	100	95-100	85-100	30-55	12-30
	12-26	Silty clay, clay	CH	A-7	0	100	100	95-100	90-100	51-85	25-55
	26-54	Clay----------	CH	A-7	0	100	100	95-100	90-100	65-85	35-55
	54-72	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	95-100	90-100	51-85	25-55
30, 31---------- Lily	0-11	Fine sandy loam	SM	A-4, A-2	0-5	90-100	85-100	55-80	25-50	<20	NP-4
	11-38	Clay loam, sandy clay loam, loam.	SM, SC, ML, CL	A-4, A-6	0-5	90-100	85-100	75-100	40-80	<35	3-15
	38-40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
32*: Lily-----------	0-11	Fine sandy loam	SM	A-4, A-2	0-5	90-100	85-100	55-80	25-50	<20	NP-4
	11-38	Clay loam, sandy clay loam, loam.	SM, SC, ML, CL	A-4, A-6	0-5	90-100	85-100	75-100	40-80	<35	3-15
	38-40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
32*:											
Ramsey	0-14	Fine sandy loam	SM, CL-ML, ML, CL	A-4, A-2	0-10	85-100	75-95	60-75	34-70	<25	2-8
	14-16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
33, 34	0-5	Fine sandy loam	SM, ML	A-4	0	85-100	80-100	70-100	40-70	<30	NP-7
Linker	5-24	Fine sandy loam, sandy clay loam, loam.	CL, SC, SM, ML	A-4, A-6	0-10	90-100	80-100	70-100	40-80	<40	NP-18
	24-30	Gravelly sandy clay loam, gravelly fine sandy loam, sandy clay loam.	CL, SC, GC, ML	A-4, A-6	0-10	65-100	60-100	55-100	40-80	<40	NP-18
	30-32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
35, 36, 37	0-4	Gravelly fine sandy loam.	ML, GM, SM	A-2, A-4	0-5	60-100	60-100	55-100	25-70	<30	NP-7
Linker	4-24	Fine sandy loam, sandy clay loam, loam.	CL, SC, SM, ML	A-4, A-6	0-10	90-100	80-100	70-100	40-80	<40	NP-18
	24-30	Gravelly sandy clay loam, gravelly fine sandy loam, sandy clay loam.	CL, SC, GC, ML	A-4, A-6	0-10	65-100	60-100	55-100	40-80	<40	NP-18
	30-32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
38, 39, 40	0-4	Silt loam	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
Loring	4-25	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	8-20
	25-72	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	8-22
41*:											
Moko	0-3	Very stony silt loam.	ML, CL, CL-ML	A-4, A-6	35-75	65-90	50-72	45-70	40-60	18-38	3-15
	3-10	Very stony silt loam, very stony loam, very stony silty clay loam.	ML, CL CL-ML	A-4, A-6	35-75	65-90	50-72	45-70	40-60	18-38	3-15
	10-12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
42	0-5	Stony fine sandy loam.	GM	A-1, A-2	15-60	40-50	30-50	20-40	15-25	<20	NP
Mountainburg	5-18	Very gravelly sandy clay loam, very gravelly loam, very gravelly fine sandy loam.	GM, GC, GM-GC	A-1, A-2	15-60	40-60	30-50	25-50	20-30	<30	NP-10
	18-20	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
43, 44---------- Newnata	0-4	Silty clay loam	CL, CL-ML	A-2, A-4, A-6	0-5	95-100	85-100	75-90	70-85	<30	5-15
	4-12	Clay loam, silty clay loam, silty clay.	CL	A-4, A-6, A-7	0-10	90-100	80-95	70-90	60-80	30-45	10-25
	12-48	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0-10	95-100	85-95	75-95	70-90	40-60	20-35
	48-52	Weathered bedrock	---	---	---	---	---	---	---	---	---
	52-55	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
45, 46, 47------- Noark	0-14	Very cherty silt loam.	GM	A-2, A-1, A-4	0	20-50	20-50	20-50	15-45	<20	NP-3
	14-24	Very cherty silt loam, very cherty silty clay loam.	GC, GM-GC	A-2, A-4, A-6, A-1	0	20-50	20-50	20-50	15-45	20-35	5-15
	24-52	Very cherty clay, very cherty silty clay.	GC	A-2, A-7	5-10	20-50	20-50	20-50	15-45	41-60	20-35
	52-72	Very cherty clay	GC, GM-GC, GP-GC	A-2	5-10	10-40	10-40	10-40	5-35	41-60	20-35
48---------- Peridge	0-6	Silt loam--------	ML, CL-ML	A-4	0	95-100	90-100	85-90	80-85	<20	NP-5
	6-40	Silty clay loam, silt loam.	CL	A-6	0	95-100	90-100	85-95	80-95	30-40	11-20
	40-72	Gravelly silty clay loam, silty clay loam.	CL, SC, GC	A-6	0	55-100	50-100	45-90	40-85	30-40	11-20
49*: Pits.											
Dumps.											
50, 51---------- Portia	0-12	Fine sandy loam	SM, ML	A-4	0	100	85-100	70-85	35-60	---	NP
	12-26	Loam, clay loam, sandy clay loam.	CL, ML, CL-ML	A-4, A-6	0	100	85-100	75-95	65-80	18-30	3-12
	26-42	Clay loam, loam, sandy clay loam.	CL	A-4, A-6	0	100	85-100	80-95	65-85	25-40	8-20
	42-72	Sandy clay, clay loam, sandy clay loam.	CL, SC	A-4, A-6, A-7	0	100	85-100	80-95	36-75	25-45	8-30
52, 53---------- Saffell	0-8	Gravelly fine sandy loam.	SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	8-52	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-65	20-55	15-35	20-40	4-18
	52-72	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
54---------- Secesh	0-6	Silt loam--------	ML, CL-ML	A-4	0-10	85-100	80-100	75-95	60-90	20-30	NP-7
	6-25	Silty clay loam, silt loam.	CL, CL-ML	A-4, A-6	0-10	80-100	75-100	70-95	60-90	25-35	5-12
	25-36	Cherty silty clay loam, cherty sandy clay loam, cherty clay loam.	CL, GC, SC	A-6	0-10	65-90	55-80	50-75	40-65	30-40	11-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
54---------- Secesh	36-62	Cherty silt loam, very cherty silt loam, very cherty loam.	GC, SC	A-6, A-2-6	10-20	50-75	35-65	25-45	20-40	30-40	11-20
	62-72	Very cherty silt loam, very cherty loam, cherty silt loam.	GC, SC, GP-GC,	A-6, A-2	15-45	40-70	25-65	20-45	10-40	30-40	11-20
55, 56, 57------- Sidon	0-4	Silt loam--------	ML, CL-ML CL	A-4	0	100	95-100	75-90	65-85	<25	2-10
	4-24	Silty clay loam, clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	95-100	75-100	60-75	20-37	5-18
	24-38	Clay loam, loam, gravelly clay loam.	CL, SC	A-4, A-6	0	95-100	50-100	40-94	35-70	20-35	8-15
	38-45	Clay loam, loam, gravelly clay loam.	CL, SC	A-2, A-4, A-6	0-5	80-100	45-100	35-85	25-60	20-30	8-15
	45-47	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
58---------- Spadra	0-8	Fine sandy loam	ML, SM	A-2, A-4	0	85-100	80-100	65-80	30-75	<20	NP-3
	8-40	Loam, sandy clay loam.	CL, CL-ML	A-4, A-6	0	90-100	90-100	80-95	55-75	25-40	5-15
	40-72	Fine sandy loam, loam, gravelly fine sandy loam.	ML, CL, SM, SC	A-4, A-2, A-1	0	70-100	70-100	40-85	20-65	<30	NP-10
59---------- Sturkie	0-26	Silt loam--------	ML, CL-ML	A-4	0	100	90-100	80-100	70-90	<25	NP-7
	26-50	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	90-100	85-100	75-95	20-35	5-15
	50-72	Silt loam, silty clay loam, loam.	ML, CL-ML, CL	A-4, A-6	0	100	85-100	80-100	70-95	<30	NP-10
60---------- Taft	0-14	Silt loam--------	CL-ML, ML	A-4	0	100	95-100	90-100	75-95	18-30	2-10
	14-22	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	95-100	95-100	85-95	23-38	5-16
	22-46	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6, A-7	0	95-100	90-100	85-100	80-95	23-42	5-20
	46-72	Silty clay loam, silt loam.	ML, CL, CL-ML	A-6, A-7	0-20	65-100	55-100	45-90	36-85	35-48	12-22
61, 62, 63------- Wallen	0-8	Gravelly silt loam.	ML, SM, CL-ML, SM-SC	A-2, A-4	2-10	70-85	60-80	40-70	30-55	<35	NP-10
	8-26	Very cobbly loam, very cobbly silt loam, very cobbly fine sandy loam.	GM, GM-GC, GC, SM	A-2, A-4, A-1	25-55	35-65	30-60	20-55	13-52	<30	NP-8
	26-28	Unweathered bedrock.									
64---------- Wideman	0-10	Loamy fine sand	SM, SP-SM	A-2	0	100	70-100	50-75	10-35	---	NP
	10-44	Fine sandy loam, fine sand.	SM, ML, CL-ML, SM-SC	A-2, A-4	0	100	100	65-100	30-75	<25	NP-5
	44-64	Loamy sand, loamy fine sand, fine sand.	SM, SP-SM	A-2	0	100	70-100	50-75	10-35	---	NP
	64-72	Fine sandy loam, sandy loam, loamy fine sand.	SM, ML	A-2, A-4	0	100	95-100	65-90	25-55	<20	NP-3

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
1----------	0-6	18-25	1.25-1.50	0.6-2.0	0.16-0.24	4.5-6.0	Low----------	0.43	5	0.5-2
Amagon	6-16	18-30	1.25-1.50	0.6-2.0	0.16-0.24	4.5-6.0	Low----------	0.43		
	16-41	20-35	1.25-1.50	0.06-0.2	0.16-0.24	4.5-6.0	Moderate-----	0.37		
	41-72	20-35	1.25-1.60	0.06-0.6	0.15-0.24	5.1-7.8	Low----------	0.43		
2*:										
Arkana----------	0-6	15-30	1.25-1.50	0.6-2.0	0.10-0.16	5.6-7.8	Low----------	0.32	2	2-4
	6-24	60-85	1.15-1.45	<0.06	0.12-0.18	5.1-8.4	High---------	0.32		
	24-26	---	---	---	---	---	----------	----		
Moko----------	0-3	18-35	1.25-1.60	0.6-2.0	0.09-0.14	6.6-7.8	Low----------	0.32	1	2-4
	3-10	18-35	1.25-1.60	0.6-2.0	0.09-0.14	6.6-7.8	Low----------	0.32		
	10-12	---	---	---	---	---	----------	----		
3----------	0-24	18-35	1.30-1.45	0.6-2.0	0.19-0.22	6.1-7.8	Low----------	0.37	5	2-4
Arrington	24-72	20-40	1.30-1.45	0.6-2.0	0.17-0.22	6.1-7.8	Low----------	0.32		
4----------	0-5	10-25	1.25-1.60	0.6-2.0	0.11-0.24	4.5-6.0	Low----------	0.37	5	0.5-2
Askew	5-42	20-35	1.25-1.60	0.6-2.0	0.15-0.24	4.5-6.0	Moderate-----	0.32		
	42-72	10-25	1.35-1.60	0.6-6.0	0.10-0.24	4.5-6.0	Low----------	0.24		
5, 6----------	0-12	5-20	1.30-1.50	0.6-6.0	0.07-0.15	4.5-5.5	Low----------	0.24	3	0.5-2
Boden	12-22	10-35	1.30-1.50	0.6-2.0	0.09-0.17	4.5-5.5	Low----------	0.32		
	22-38	35-55	1.15-1.35	0.2-0.6	0.12-0.18	4.5-5.5	Moderate-----	0.28		
	38-44	30-45	1.25-1.40	0.6-2.0	0.08-0.18	4.5-5.5	Moderate-----	0.32		
	44-56	15-35	1.30-1.50	0.6-2.0	0.09-0.17	4.5-5.5	Low----------	0.24		
	56-58	---	---	---	---	---	----------	----		
7----------	0-3	5-20	1.30-1.50	0.6-6.0	0.07-0.15	4.5-6.0	Low----------	0.28	3	0.5-2
Boden	3-22	10-35	1.30-1.50	0.6-2.0	0.09-0.17	4.5-6.0	Low----------	0.32		
	22-38	35-55	1.15-1.35	0.2-0.6	0.12-0.18	4.5-5.5	Moderate-----	0.28		
	38-44	30-45	1.25-1.40	0.6-2.0	0.08-0.18	4.5-5.5	Moderate-----	0.32		
	44-56	15-35	1.30-1.50	0.6-2.0	0.09-0.17	4.5-5.5	Low----------	0.24		
	56-58	---	---	---	---	---	----------	----		
8----------	0-14	3-10	1.30-1.60	0.6-2.0	0.10-0.20	4.5-6.0	Low----------	0.28	5	0.5-2
Brockwell	14-48	10-20	1.30-1.60	0.6-2.0	0.12-0.20	4.5-6.0	Low----------	0.28		
	48-80	15-30	1.30-1.60	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.24		
9, 10----------	0-6	12-25	1.30-1.50	0.6-2.0	0.16-0.24	5.1-6.5	Low----------	0.43	3	0.5-2
Captina	6-24	18-35	1.40-1.50	0.6-2.0	0.16-0.24	3.6-5.5	Low----------	0.37		
	24-50	18-35	1.50-1.70	0.06-0.2	0.08-0.12	3.6-5.5	Low----------	0.32		
	50-72	18-35	1.40-1.65	0.06-0.2	0.01-0.03	3.6-5.5	Low----------	0.32		
11, 12, 13-------	0-14	14-20	1.30-1.60	2.0-6.0	0.07-0.12	4.5-6.0	Low----------	0.28	2	0.5-2
Clarksville	14-72	25-35	1.40-1.65	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.28		
14*:										
Clarksville-----	0-14	14-20	1.30-1.60	2.0-6.0	0.07-0.12	4.5-6.0	Low----------	0.28	2	0.5-2
	14-72	25-35	1.40-1.65	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.28		
Udorthents.										
15----------	0-20	10-27	1.30-1.65	0.2-0.6	0.20-0.23	4.5-8.4	Low----------	0.43	4	0.5-2
Crowley	20-40	35-50	1.20-1.80	<0.06	0.19-0.21	4.5-6.5	High---------	0.32		
	40-72	27-55	1.30-1.80	0.06-0.2	0.20-0.22	5.6-8.4	Moderate-----	0.32		
16----------	0-6	5-18	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.37	5	0.5-2
Dubbs	6-50	20-35	1.45-1.55	0.6-2.0	0.18-0.22	4.5-6.0	Moderate-----	0.37		
	50-72	10-25	1.40-1.50	2.0-6.0	0.20-0.22	4.5-6.0	Low----------	0.37		
17----------	0-7	20-35	1.30-1.45	0.2-0.6	0.18-0.22	5.6-7.3	Moderate-----	0.32	4	2-4
Egam	7-58	35-50	1.30-1.45	0.2-0.6	0.14-0.20	5.6-7.3	Moderate-----	0.32		
	58-72	30-45	1.30-1.45	0.2-0.6	0.12-0.18	5.6-8.0	Moderate-----	0.37		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm^3	In/hr	In/in	pH				Pct
18----------	0-7	20-35	1.30-1.45	0.2-0.6	0.18-0.22	5.6-7.3	Moderate-----	0.32	4	2-4
Egam	7-58	35-50	1.30-1.45	0.2-0.6	0.14-0.20	5.6-7.3	Moderate-----	0.32		
	58-72	30-45	1.30-1.45	0.2-0.6	0.12-0.18	5.6-8.0	Moderate-----	0.37		
19, 20----------	0-8	10-25	1.25-1.60	0.6-2.0	0.10-0.20	3.6-5.5	Low----------	0.37	3	0.5-2
Enders	8-58	35-60	1.15-1.45	<0.06	0.12-0.18	3.6-5.5	High---------	0.37		
	58-60	---	---	---	---	---	----------	----		
21, 22----------	0-10	10-25	1.25-1.60	0.6-2.0	0.15-0.22	3.6-5.5	Low----------	0.43	3	0.5-2
Enders	10-58	35-60	1.15-1.45	<0.06	0.09-0.13	3.6-5.5	High---------	0.24		
	58-60	---	---	---	---	---	----------	----		
23----------	0-11	10-20	1.25-1.60	0.6-2.0	0.13-0.24	4.5-7.3	Low----------	0.43	3	0.5-2
Foley	11-23	20-35	1.25-1.50	0.2-0.6	0.18-0.24	5.1-7.3	Moderate-----	0.43		
	23-54	20-35	1.25-1.50	<0.06	0.10-0.14	5.1-9.0	Moderate-----	0.43		
	54-72	15-25	1.25-1.50	<0.06	0.10-0.14	6.6-9.0	Low----------	0.49		
24----------	0-4	10-25	1.50-1.55	0.2-0.6	0.20-0.22	4.5-6.0	Low----------	0.43	5	0.5-2
Forestdale	4-56	35-60	1.50-1.60	<0.06	0.14-0.18	4.5-6.0	High---------	0.28		
	56-80	10-35	1.45-1.55	0.2-0.6	0.17-0.22	4.5-7.8	Moderate-----	0.37		
25, 26, 27----	0-12	10-25	1.25-1.45	0.6-2.0	0.06-0.12	5.1-6.5	Low----------	0.28	4	0.5-2
Gepp	12-23	65-85	1.15-1.30	0.6-2.0	0.10-0.18	4.5-6.0	Moderate-----	0.28		
	23-65	65-85	1.15-1.30	0.6-2.0	0.08-0.18	5.1-6.0	Moderate-----	0.28		
	65-70	---	---	---	---	---	----------	----		
28----------	0-12	10-25	1.25-1.45	0.6-2.0	0.16-0.24	5.6-7.3	Low----------	0.37	5	0.5-2
Hontas	12-72	15-35	1.25-1.45	0.6-2.0	0.16-0.24	5.6-7.8	Low----------	0.37		
29----------	0-12	30-40	1.25-1.40	0.2-0.6	0.18-0.22	4.5-6.0	Moderate-----	0.43	5	0.5-2
Jackport	12-26	45-65	1.15-1.35	<0.06	0.12-0.18	4.5-5.5	High---------	0.32		
	26-54	60-80	1.15-1.30	<0.06	0.12-0.18	4.5-5.5	High---------	0.32		
	54-72	30-70	1.15-1.40	<0.06	0.12-0.18	4.5-7.8	High---------	0.32		
30, 31----------	0-11	5-20	1.20-1.40	2.0-6.0	0.09-0.16	3.6-5.5	Low----------	0.28	3	0.5-2
Lily	11-38	18-35	1.25-1.55	2.0-6.0	0.12-0.18	3.6-5.5	Low----------	0.28		
	38-40	---	---	---	---	---	----------	----		
32*:										
Lily----------	0-11	5-20	1.20-1.40	2.0-6.0	0.09-0.16	3.6-5.5	Low----------	0.28	3	0.5-2
	11-38	18-35	1.25-1.55	2.0-6.0	0.12-0.18	3.6-5.5	Low----------	0.28		
	38-40	---	---	---	---	---	----------	----		
Ramsey----------	0-14	8-25	1.20-1.40	6.0-20	0.09-0.12	4.5-5.5	Low----------	0.17	1	0.5-2
	14-16	---	---	---	---	---	----------	----		
Rock outcrop.										
33, 34----------	0-5	5-20	1.30-1.60	0.6-2.0	0.11-0.20	3.6-5.5	Low----------	0.28	3	0.5-3
Linker	5-24	18-35	1.30-1.60	0.6-2.0	0.11-0.20	3.6-5.5	Low----------	0.32		
	24-30	18-35	1.30-1.60	0.6-2.0	0.08-0.20	3.6-5.5	Low----------	0.28		
	30-32	---	---	---	---	---	----------	----		
35, 36, 37----	0-4	5-20	1.30-1.60	0.6-2.0	0.11-0.17	3.6-5.5	Low----------	0.24	3	0.5-3
Linker	4-24	18-35	1.30-1.60	0.6-2.0	0.11-0.20	3.6-5.5	Low----------	0.32		
	24-30	18-35	1.30-1.60	0.6-2.0	0.08-0.20	3.6-5.5	Low----------	0.28		
	30-32	---	---	---	---	---	----------	----		
38, 39, 40----	0-4	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low----------	0.43	3	0.5-2
Loring	4-25	18-35	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.43		
	25-72	12-25	1.50-1.70	0.2-0.6	0.06-0.13	4.5-6.0	Low----------	0.43		
41*:										
Moko----------	0-10	18-35	1.25-1.60	0.6-2.0	0.09-0.14	6.6-7.8	Low----------	0.32	1	2-4
	10-12	---	---	---	---	---	----------	----		
Rock outcrop.										

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
42---------- Mountainburg	0-5	4-12	1.30-1.60	2.0-6.0	0.05-0.10	4.5-6.0	Low----------	0.17	1	0.5-2
	5-18	10-18	1.30-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.24		
	18-20	---	---	---	---	---	----------	----		
43, 44---------- Newnata	0-4	15-35	1.25-1.60	0.6-2.0	0.15-0.24	4.5-7.3	Low----------	0.43		0.5-2
	4-12	25-40	1.25-1.55	0.2-0.6	0.12-0.22	5.1-7.8	Moderate-----	0.37		
	12-48	35-55	1.15-1.50	0.06-0.2	0.12-0.18	5.1-7.8	High---------	0.32		
	48-52	---	---	---	---	---	----------	----		
	52-55	---	---	---	---	---	----------	----		
45, 46, 47------- Noark	0-14	10-25	1.30-1.50	0.6-2.0	0.10-0.14	4.5-6.5	Low----------	0.32	3	0.5-2
	14-24	30-40	1.30-1.50	0.6-2.0	0.10-0.14	3.6-5.5	Low----------	0.28		
	24-52	45-75	1.20-1.50	0.6-2.0	0.09-0.13	3.6-5.5	Low----------	0.24		
	52-72	45-75	1.15-1.45	0.6-2.0	0.06-0.09	3.6-5.5	Low----------	0.24		
48---------- Peridge	0-6	10-20	1.25-1.45	0.6-2.0	0.16-0.24	4.5-6.0	Low----------	0.37	5	0.5-2
	6-40	20-34	1.25-1.45	0.6-2.0	0.18-0.22	4.5-6.0	Low----------	0.32		
	40-72	30-40	1.25-1.40	0.6-2.0	0.13-0.22	4.5-6.0	Low----------	0.28		
49*: Pits.										
Dumps.										
50, 51---------- Portia	0-12	7-20	1.30-1.60	0.6-2.0	0.11-0.15	5.1-6.5	Low----------	0.24	3	0.5-2
	12-26	18-35	1.30-1.60	0.6-2.0	0.15-0.24	4.5-6.0	Low----------	0.32		
	26-42	20-40	1.30-1.60	0.2-2.0	0.10-0.17	4.5-6.0	Low----------	0.32		
	42-72	20-40	1.20-1.60	0.2-2.0	0.12-0.20	5.1-6.0	Moderate-----	0.28		
52, 53---------- Saffell	0-8	5-20	1.30-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.20	4	0.5-2
	8-52	12-35	1.25-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low----------	0.28		
	52-72	10-25	1.30-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low----------	0.17		
54---------- Secesh	0-6	15-25	1.10-1.30	0.6-2.0	0.16-0.20	5.6-6.5	Low----------	0.32	3	0.5-2
	6-25	20-30	1.20-1.40	0.6-2.0	0.13-0.19	4.5-6.0	Low----------	0.32		
	25-36	25-35	1.20-1.40	0.6-2.0	0.09-0.14	4.5-6.0	Low----------	0.32		
	36-62	25-35	1.30-1.50	0.6-2.0	0.05-0.09	4.5-6.0	Low----------	0.24		
	62-72	25-35	1.30-1.50	2.0-6.0	0.03-0.08	4.5-6.0	Low----------	0.24		
55, 56, 57------- Sidon	0-4	8-25	1.20-1.40	0.6-2.0	0.13-0.24	3.6-5.5	Low----------	0.43	3	0.5-2
	4-24	18-35	1.20-1.40	0.6-2.0	0.15-0.24	3.6-5.5	Low----------	0.43		
	24-38	18-40	1.40-1.60	0.06-0.6	0.08-0.15	3.6-5.5	Low----------	0.37		
	38-45	18-35	1.30-1.60	0.06-0.6	0.12-0.20	3.6-5.5	Low----------	0.32		
	45-47	---	---	---	---	---	----------	----		
58---------- Spadra	0-8	10-26	1.30-1.60	0.6-2.0	0.11-0.24	4.5-6.0	Low----------	0.37	5	0.5-2
	8-40	18-32	1.30-1.60	0.6-2.0	0.12-0.20	4.5-6.0	Low----------	0.37		
	40-72	15-25	1.30-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.24		
59---------- Sturkie	0-26	10-27	1.20-1.40	0.6-2.0	0.14-0.24	5.6-7.8	Low----------	0.37	5	2-4
	26-50	15-35	1.20-1.40	0.6-2.0	0.16-0.24	6.1-8.4	Low----------	0.37		
	50-72	15-35	1.20-1.40	0.6-2.0	0.13-0.24	6.1-8.4	Low----------	0.37		
60---------- Taft	0-14	10-25	1.30-1.40	0.6-2.0	0.20-0.22	4.5-5.5	Low----------	0.43	3	0.5-2
	14-22	18-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-5.5	Low----------	0.43		
	22-46	15-35	1.50-1.65	0.06-0.2	0.03-0.07	4.5-5.5	Low----------	0.43		
	46-72	8-45	1.35-1.60	0.2-0.6	0.01-0.03	4.5-5.5	Low----------	0.37		
61, 62, 63------- Wallen	0-8	8-20	1.40-1.55	2.0-6.0	0.07-0.12	4.5-6.0	Low----------	0.17	2	0.5-2
	8-26	8-20	1.40-1.55	2.0-6.0	0.05-0.09	4.5-6.0	Low----------	0.20		
	26-28	---	---	---	---	---	----------	----		
64---------- Wideman	0-10	2-12	1.40-1.60	>6.0	0.05-0.11	3.6-6.0	Low----------	0.17	5	0.5-1
	10-44	5-18	1.30-1.50	2.0-6.0	0.06-0.20	5.1-7.3	Low----------	0.20		
	44-64	2-12	1.40-1.60	>6.0	0.05-0.11	5.1-7.3	Low----------	0.17		
	64-72	5-18	1.30-1.50	2.0-6.0	0.10-0.15	5.1-7.3	Low----------	0.17		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
1----- Amagon	D	Frequent----	Very brief to brief.	Dec-Apr	1.0-2.0	Perched	Dec-Apr	>60	---	High-----	High.
2*:											
Arkana-----	C	None--------	---	---	>6.0	---	---	20-40	Hard	High-----	Moderate.
Moko-----	D	None--------	---	---	>6.0	---	---	6-20	Hard	Low------	Low.
3----- Arrington	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low.
4----- Askew	C	None--------	---	---	1.0-2.0	Perched	Dec-Apr	>60	---	High-----	Moderate.
5, 6----- Boden	C	None--------	---	---	>6.0	---	---	40-60	Hard	Moderate	High.
7----- Boden	C	None--------	---	---	>6.0	---	---	40-60	Hard	Low------	High.
8----- Brockwell	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
9, 10----- Captina	C	None--------	---	---	2.0-3.0	Perched	Dec-Apr	40-60	Soft	High-----	High.
11, 12, 13-------- Clarksville	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
14*:											
Clarksville------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
Udorthents.											
15----- Crowley	D	None--------	---	---	0.5-1.5	Perched	Dec-Apr	>60	---	High-----	Moderate.
16----- Dubbs	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
17----- Egam	C	Rare--------	---	---	3.0-4.0	Apparent	Dec-Mar	>60	---	High-----	Low.
18----- Egam	C	Occasional	Very brief	Dec-Mar	3.0-4.0	Apparent	Dec-Mar	>60	---	High-----	Low.
19, 20, 21, 22---- Enders	C	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.
23----- Foley	D	None--------	---	---	0-1.0	Perched	Dec-Apr	>60	---	High-----	Low.
24----- Forestdale	D	Frequent----	Brief to long.	Jan-Apr	0.5-2.0	Apparent	Jan-Apr	>60	---	High-----	Moderate.
25, 26, 27-------- Gepp	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
28----- Hontas	B	Occasional	Very brief to brief.	Dec-Apr	2.0-2.5	Apparent	Dec-Apr	>60	---	Moderate	Low.
29----- Jackport	D	None--------	---	---	0-1.0	Perched	Dec-Apr	>60	---	High-----	High.
30, 31----- Lily	B	None--------	---	---	>6.0	---	---	20-40	Hard	Moderate	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
32*:											
Lily	B	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High.
Ramsey	D	None	---	---	>6.0	---	---	10-20	Hard	Low	Moderate.
Rock outcrop.											
33, 34, 35, 36, 37--- Linker	B	None	---	---	>6.0	---	---	20-40	Hard	Low	High.
38, 39, 40--- Loring	C	None	---	---	2.0-3.0	Perched	Dec-Mar	>60	---	Moderate	Moderate.
41*:											
Moko	D	None	---	---	>6.0	---	---	6-20	Hard	Low	Low.
Rock outcrop.											
42--- Mountainburg	D	None	---	---	>6.0	---	---	12-20	Hard	Low	Moderate.
43, 44--- Newnata	C	None	---	---	>6.0	---	---	40-60	Hard	High	Moderate.
45, 46, 47--- Noark	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
48--- Peridge	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
49*:											
Pits.											
Dumps.											
50, 51--- Portia	C	None	---	---	>6.0	---	---	>60	---	High	High.
52, 53--- Saffell	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
54--- Secesh	B	Frequent	Brief	Nov-Apr	>6.0	---	---	>60	---	Low	Moderate.
55, 56, 57--- Sidon	C	None	---	---	2.0-3.0	Perched	Jan-Apr	40-72	Hard	Moderate	Moderate.
58--- Spadra	B	None	---	---	>6.0	---	---	>60	---	Low	High.
59--- Sturkie	B	Frequent	Brief	Dec-Apr	>6.0	---	---	>60	---	Low	Low.
60--- Taft	C	None	---	---	1.0-2.0	Perched	Jan-Apr	>60	---	High	High.
61, 62, 63--- Wallen	C	None	---	---	>6.0	---	---	20-40	Hard	Low	High.
64--- Wideman	A	Frequent	Very brief	Mar-May	>6.0	---	---	>60	---	Low	Low.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Amagon	Fine-silty, mixed, thermic Typic Ochraqualfs
Arkana	Very-fine, mixed, mesic Mollic Hapludalfs
Arrington	Fine-silty, mixed, thermic Cumulic Hapludolls
Askew	Fine-silty, mixed, thermic Aquic Hapludalfs
Boden	Clayey, mixed, mesic Typic Hapludults
Brockwell	Coarse-loamy, siliceous, mesic Typic Paleudults
Captina	Fine-silty, mixed, mesic Typic Fragiudults
Clarksville	Loamy-skeletal, siliceous, mesic Typic Paleudults
Crowley	Fine, montmorillonitic, thermic Typic Albaqualfs
Dubbs	Fine-silty, mixed, thermic Typic Hapludalfs
Egam	Fine, mixed, thermic Cumulic Hapludolls
Enders	Clayey, mixed, thermic Typic Hapludults
Foley	Fine-silty, mixed, thermic Albic Glossic Natraqualfs
Forestdale	Fine, montmorillonitic, thermic Typic Ochraqualfs
Gepp	Very-fine, mixed, mesic Typic Paleudalfs
Hontas	Fine-silty, mixed, mesic Fluvaquentic Eutrochrepts
Jackport	Very-fine, montmorillonitic, thermic Vertic Ochraqualfs
Lily	Fine-loamy, siliceous, mesic Typic Hapludults
Linker	Fine-loamy, siliceous, thermic Typic Hapludults
Loring	Fine-silty, mixed, thermic Typic Fragiudalfs
Moko	Loamy-skeletal, mixed, mesic Lithic Hapludolls
Mountainburg	Loamy-skeletal, siliceous, thermic Lithic Hapludults
Newnata	Fine, mixed, mesic Typic Hapludalfs
Noark	Clayey-skeletal, mixed, mesic Typic Paleudults
Peridge	Fine-silty, mixed, mesic Typic Paleudalfs
Portia	Fine-loamy, siliceous, mesic Typic Paleudalfs
Ramsey	Loamy, siliceous, mesic Lithic Dystrochrepts
Saffell	Loamy-skeletal, siliceous, thermic Typic Hapludults
*Secesh	Fine-loamy, siliceous, mesic Ultic Hapludalfs
Sidon	Fine-loamy, siliceous, thermic Typic Fragiudults
Spadra	Fine-loamy, siliceous, thermic Typic Hapludults
Sturkie	Fine-silty, mixed, mesic Cumulic Hapludolls
Taft	Fine-silty, siliceous, thermic Glossaquic Fragiudults
Wallen	Loamy-skeletal, siliceous, mesic Typic Dystrochrepts
Wideman	Sandy, siliceous, mesic Typic Udifluvents

* The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

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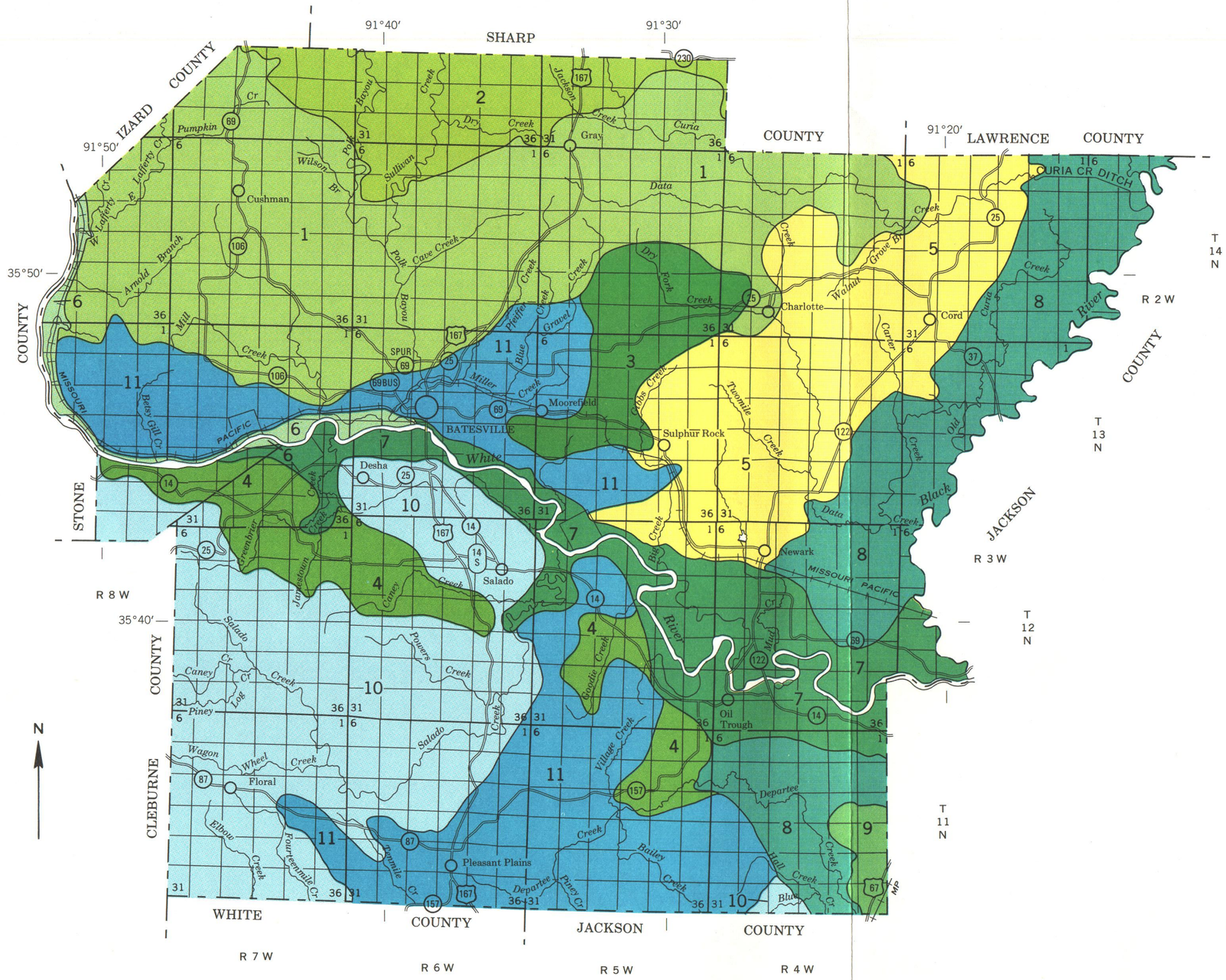


SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

LEGEND

AREAS DOMINATED BY DEEP TO SHALLOW, NEARLY LEVEL TO STEEP SOILS ON UPLANDS

1 — Clarksville-Gepp: Deep, gently sloping to steep, somewhat excessively drained and well drained very cherty soils; on side slopes and ridgetops

2 — Lily-Clarksville: Moderately deep and deep, gently sloping to steep, well drained and somewhat excessively drained loamy and cherty soils; on side slopes and ridgetops

3 — Wallen-Captina: Moderately deep and deep, nearly level to steep, somewhat excessively drained and moderately well drained gravelly and loamy soils; on side slopes, ridgetops, and stream terraces

4 — Newnata-Moko: Deep and shallow, gently sloping to moderately steep, well drained loamy and stony soils; on side slopes, ridgetops, and benches

AREAS DOMINATED BY DEEP, NEARLY LEVEL TO MODERATELY SLOPING SOILS ON UPLANDS AND TERRACES

5 — Loring-Portia: Deep, nearly level to moderately sloping, moderately well drained and well drained loamy soils; on uplands and terraces

AREAS DOMINATED BY DEEP, LEVEL TO GENTLY UNDULATING SOILS ON FLOOD PLAINS AND TERRACES

6 — Wideman-Sturkie: Deep, level to nearly level, excessively drained and well drained sandy and loamy soils; on flood plains

7 — Egam-Arrington: Deep, level to gently undulating, moderately well drained and well drained loamy soils; on flood plains and natural levees on bottom lands of the White River.

8 — Amagon-Askew-Forestdale: Deep, level to gently undulating, poorly drained and moderately well drained loamy soils; on the lower part of natural levees

9 — Jackport-Crowley: Deep, level, poorly drained and somewhat poorly drained loamy soils; on broad flats of terraces

AREAS DOMINATED BY DEEP TO SHALLOW, NEARLY LEVEL TO VERY STEEP SOILS ON UPLANDS

10 — Linker-Enders-Mountainburg: Moderately deep, deep, and shallow, gently sloping to very steep, well drained loamy, gravelly, and stony soils; on side slopes and ridgetops

11 — Linker-Sidon: Moderately deep and deep, nearly level to steep, well drained and moderately well drained loamy soils; on ridgetops, side slopes, and plateaus

Compiled 1981

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ARKANSAS AGRICULTURAL EXPERIMENT STATION

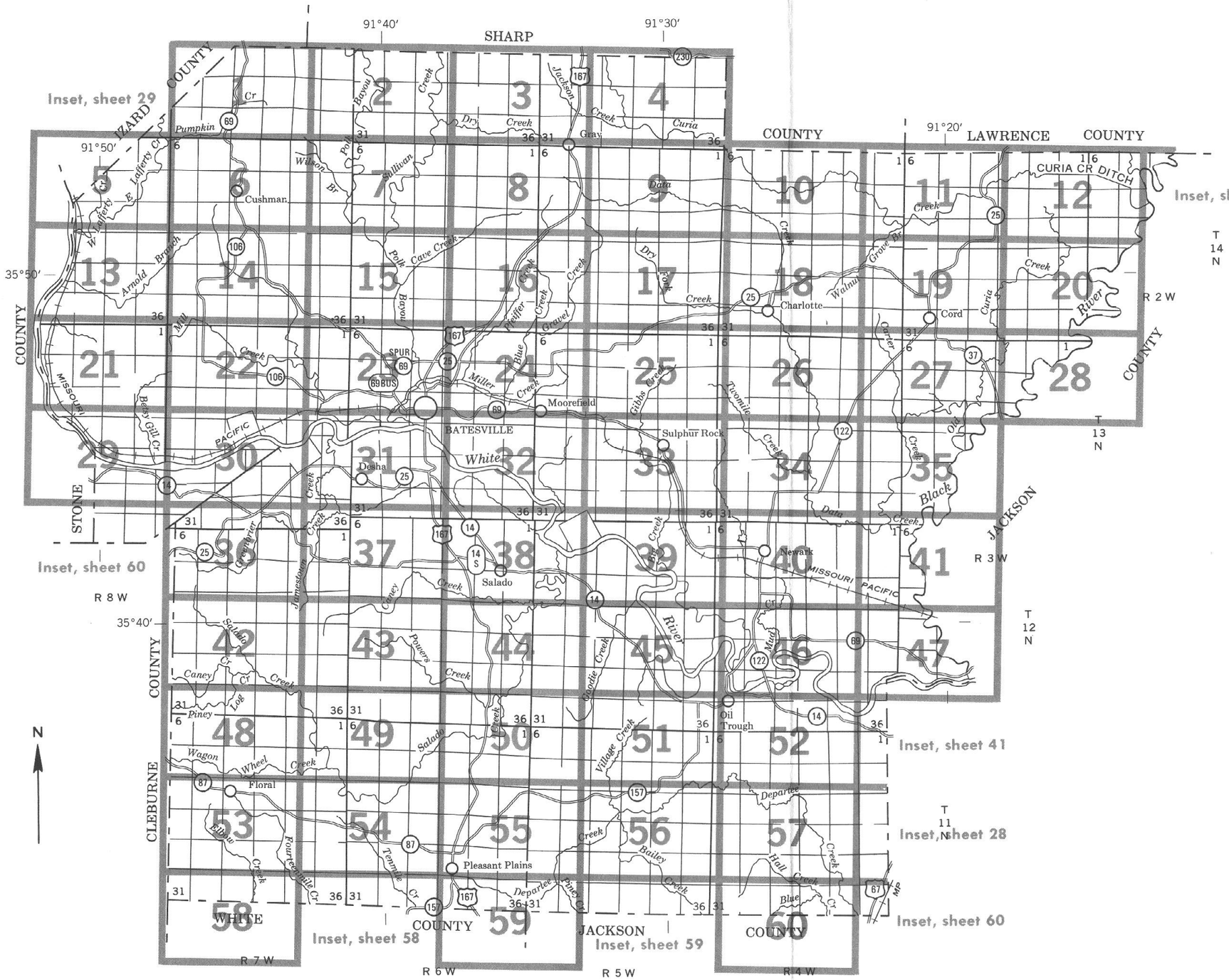
GENERAL SOIL MAP

INDEPENDENCE COUNTY
ARKANSAS

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km



SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

INDEX TO MAP SHEETS

INDEPENDENCE COUNTY
ARKANSAS

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km

SOIL LEGEND

The legend is numeric. Soils without a slope designation in the name are those that are found only on nearly level landscapes of occasionally or frequently flooded bottom lands.

SYMBOL	NAME
1	Amagon silt loam, frequently flooded
2	Arkana-Moko complex, 3 to 8 percent slopes
3	Arrington silt loam, gently undulating
4	Askew silt loam, gently undulating
5	Boden fine sandy loam, 3 to 8 percent slopes
6	Boden fine sandy loam, 8 to 12 percent slopes
7	Boden stony fine sandy loam, 8 to 20 percent slopes
8	Brockwell fine sandy loam, 3 to 8 percent slopes
9	Captina silt loam, 1 to 3 percent slopes
10	Captina silt loam, 3 to 8 percent slopes
11	Clarksville very cherty silt loam, 3 to 8 percent slopes
12	Clarksville very cherty silt loam, 8 to 20 percent slopes
13	Clarksville very cherty silt loam, 20 to 40 percent slopes
14	Clarksville-Udorthents complex, 20 to 40 percent slopes
15	Crowley silt loam, 0 to 1 percent slopes
16	Dubbs silt loam, gently undulating
17	Egam silt loam, 0 to 1 percent slopes
18	Egam silty clay loam, occasionally flooded
19	Enders fine sandy loam, 3 to 8 percent slopes
20	Enders fine sandy loam, 8 to 12 percent slopes
21	Enders stony fine sandy loam, 8 to 20 percent slopes
22	Enders stony fine sandy loam, 20 to 45 percent slopes
23	Foley silt loam, 0 to 1 percent slopes
24	Forestdale silt loam, frequently flooded
25	Gepp very cherty silt loam, 3 to 8 percent slopes
26	Gepp very cherty silt loam, 8 to 12 percent slopes
27	Gepp very cherty silt loam, 12 to 30 percent slopes
28	Hontas silt loam, occasionally flooded
29	Jackport silty clay loam, 0 to 1 percent slopes
30	Lily fine sandy loam, 3 to 8 percent slopes
31	Lily fine sandy loam, 8 to 12 percent slopes
32	Lily-Ramsey-Rock outcrop complex, 8 to 30 percent slopes
33	Linker fine sandy loam, 3 to 8 percent slopes
34	Linker fine sandy loam, 8 to 12 percent slopes
35	Linker gravelly fine sandy loam, 3 to 8 percent slopes
36	Linker gravelly fine sandy loam, 8 to 12 percent slopes
37	Linker gravelly fine sandy loam, 12 to 30 percent slopes
38	Loring silt loam, 1 to 3 percent slopes
39	Loring silt loam, 3 to 8 percent slopes
40	Loring silt loam, 8 to 12 percent slopes
41	Moko-Rock outcrop complex, 3 to 20 percent slopes
42	Mountainburg stony fine sandy loam, 3 to 12 percent slopes
43	Newnata silty clay loam, 3 to 8 percent slopes
44	Newnata silty clay loam, 8 to 12 percent slopes
45	Noark very cherty silt loam, 3 to 8 percent slopes
46	Noark very cherty silt loam, 8 to 12 percnet slopes
47	Noark very cherty silt loam, 12 to 30 percent slopes
48	Peridge silt loam, 3 to 8 percent slopes
49	Pits-Dumps complex, 20 to 40 percent slopes
50	Portia fine sandy loam, 3 to 8 percent slopes
51	Portia fine sandy loam, 8 to 12 percent slopes
52	Saffell gravelly fine sandy loam, 8 to 12 percent slopes
53	Saffell gravelly fine sandy loam, 12 to 20 percent slopes
54	Secesh silt loam, frequently flooded
55	Sidon silt loam, 1 to 3 percent slopes
56	Sidon silt loam, 3 to 8 percent slopes
57	Sidon silt loam, 8 to 12 percent slopes
58	Spadra fine sandy loam, 0 to 1 percent slopes
59	Sturkie silt loam, frequently flooded
60	Taft silt loam, 0 to 2 percent slopes
61	Wallen gravelly silt loam, 3 to 8 percent slopes
62	Wallen gravelly silt loam, 8 to 12 percent slopes
63	Wallen gravelly silt loam, 12 to 30 percent slopes
64	Wideman loamy fine sand, frequently flooded

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline
- AD HOC BOUNDARY (label)
- Small airport, airfield, park, oilfield, cemetery, or flood pool
- STATE COORDINATE TICK
- LAND DIVISION CORNERS (section and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate (21)
- Federal (173)
- State (28)
- County, farm or ranch (1283)

- RAILROAD
- POWER TRANSMISSION LINE (normally not shown)
- PIPE LINE (normally not shown)
- FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label)
- Located object (label)
- Tank (label)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial
- Intermittent

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

- SOIL DELINEATIONS AND SYMBOLS (5 / 6)
- ESCARPMENTS
  - Bedrock (points down slope)
  - Other than bedrock (points down slope)
- SHORT STEEP SLOPE
- GULLY
- DEPRESSION OR SINK
- SOIL SAMPLE SITE (normally not shown)
- MISCELLANEOUS
  - Blowout
  - Clay spot
  - Gravelly spot
  - Gumbo, slick or scabby spot (sodic)
  - Dumps and other similar non soil areas
  - Prominent hill or peak
  - Rock outcrop (includes sandstone and shale)
  - Saline spot
  - Sandy spot
  - Severely eroded spot
  - Slide or slip (tips point upslope)
  - Stony spot, very stony spot

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 1

2 065 000 FEET

585 000 FEET

IZARD COUNTY

SHARP COUNTY

IZARD COUNTY

R. 8 W. | R. 7 W.

T. 15 N.

(Joins inset, sheet 29)

(Joins sheet 2)

(Joins sheet 6)

2 085 000 FEET

570 000 FEET

Branch

Pine

Hollow

Creek

Palmer

Groove

Hollow

Dishwater

Branch

Etna

Mount

Pumpkin

Brushy

Branch

Turner

Creek

20 21 22 23 30 29 28 27 26 32 31 33 34 35 36

N

5 000 Feet

1 Kilometer

Scale - 1:20000

INDEPENDENCE COUNTY, ARKANSAS NO. 1

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 2

2 110 000 FEET

585 000 FEET

R. 7 W. | R. 6 W.

SHARP COUNTY

T. 15 N.

(Joins sheet 1)

(Joins sheet 3)

(Joins sheet 7)

2 090 000 FEET

570 000 FEET

N

5 000 Feet

1 Kilometer

Scale - 1:20000

Polk Bayou

Watkins Br.

Wildcat Hollow Creek

Dishwater Branch

Brushy Branch

Polk water

Beatty Pond

Beatty Hollow

Big Hollow

Montgomery Hill

Sullivan Dry Creek

Montgomery Br.

Sandtown

Chapel Hill

23 24 19 20 21 22 26 25 30 29 28 27 35 36 31 32 33 34

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS NO. 2

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 3

INDEPENDENCE COUNTY, ARKANSAS NO. 3

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2 115 000 FEET

585 000 FEET

SHARP COUNTY

R. 6 W. | R. 5 W.

T. 15 N.

CAVE CITY

Montgomery Branch

Barnet Creek

Jackson Creek

Dry Creek

Basket Cr

(Joins sheet 2)

(Joins sheet 4)

(Joins sheet 8)

2 135 000 FEET

570 000 FEET

N

5000 Feet

1 Kilometer

Scale - 1:20000

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 4

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS NO. 5

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

2 040 000 FEET
2 035 000 FEET
570 000 FEET
565 000 FEET
560 000 FEET
555 000 FEET
2 238 000 FEET
2 060 000 FEET
3000 AND 5000-FOOT GRID TICKS

R. 2 W. LAWRENCE CO
T. 14 N.
T. 15 N.
(Joins sheet 12)
(Joins inset, sheet 29) R. 8 W.
(Joins sheet 6)
(Joins sheet 13)
R. 8 W. | R. 7 W.

BLACK RIVER
JACKSON COUNTY
IZARD COUNTY
STONE COUNTY
WHITE RIVER
MISSOURI PACIFIC
Lafferty Creek
West Lafferty Creek
East Lafferty Creek
Crosby Hollow
Hankins Hollow
Adeline Hill
Saltpeter Hollow
Dave Green Hollow
George Hill
Willard Pine Hollow
Pitman Hollow
Blowing Cave Cr
Edmonson
Clark Hill
Saltpeter Hill
water

5 000 Feet
1 Kilometer
Scale - 1:20000

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 6

6

N

R. 8 W. | R. 7 W.

T. 14 N. | T. 15 N.

2 085 000 FEET

570 000 FEET

555 000 FEET

2 065 000 FEET

(Joins sheet 1)

(Joins sheet 5)

(Joins sheet 7)

(Joins sheet 14)

Scale - 1:20000

5000 Feet

1 Kilometer

Cushman

Southern Hill

Blue Ridge

Stewart Hill

Lafferty Cr

Pumpkin Creek

Turner Creek

Wilson Branch

Spring Branch

Clubhouse Cave

Blowing Cave

Creek

Arnold Branch

Brooks Hill

Big Hollow

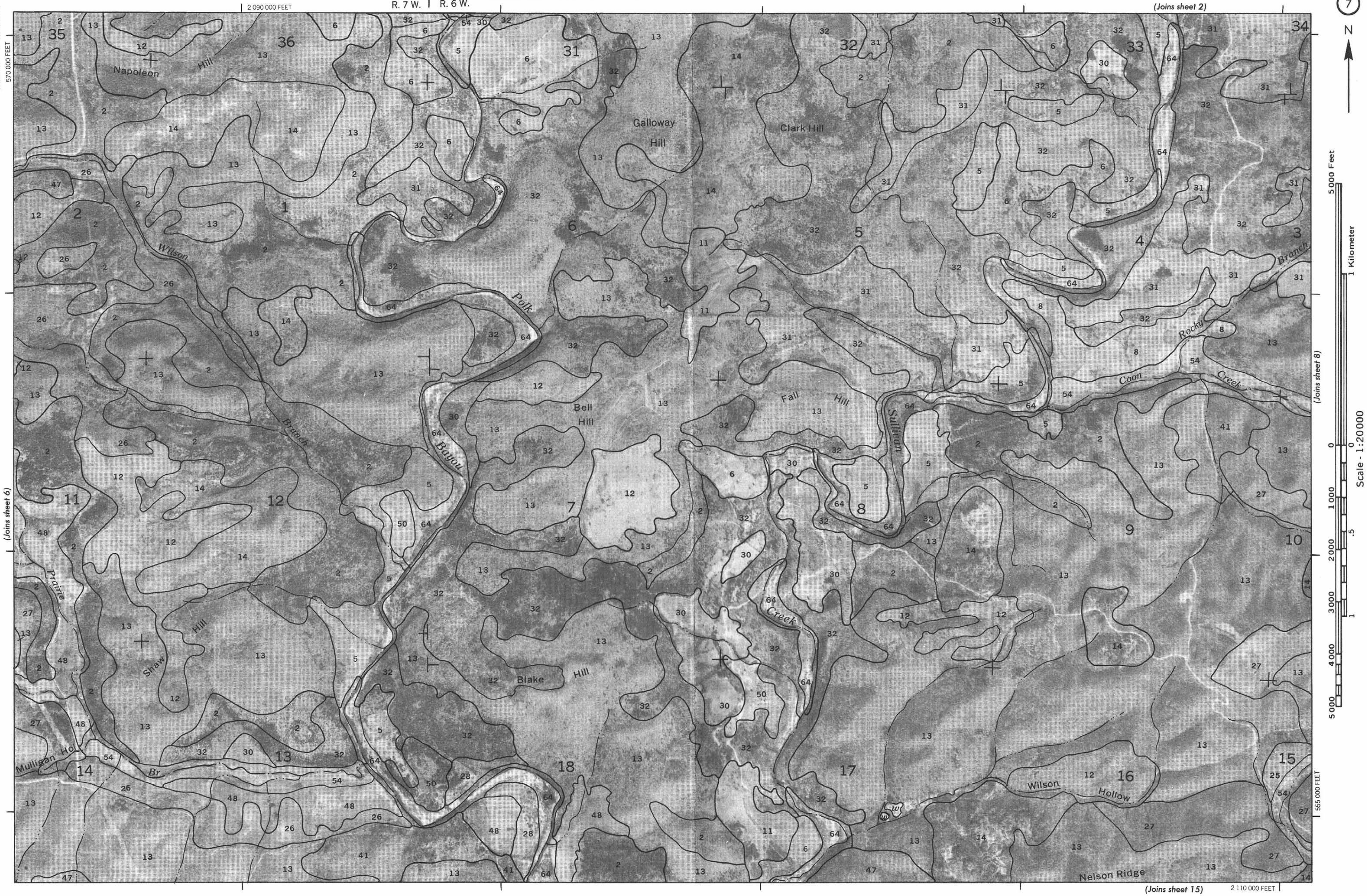
Mulligan Hollow

Prairie Branch

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS SHEET NO. 6

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 7



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INDEPENDENCE COUNTY, ARKANSAS NO. 7

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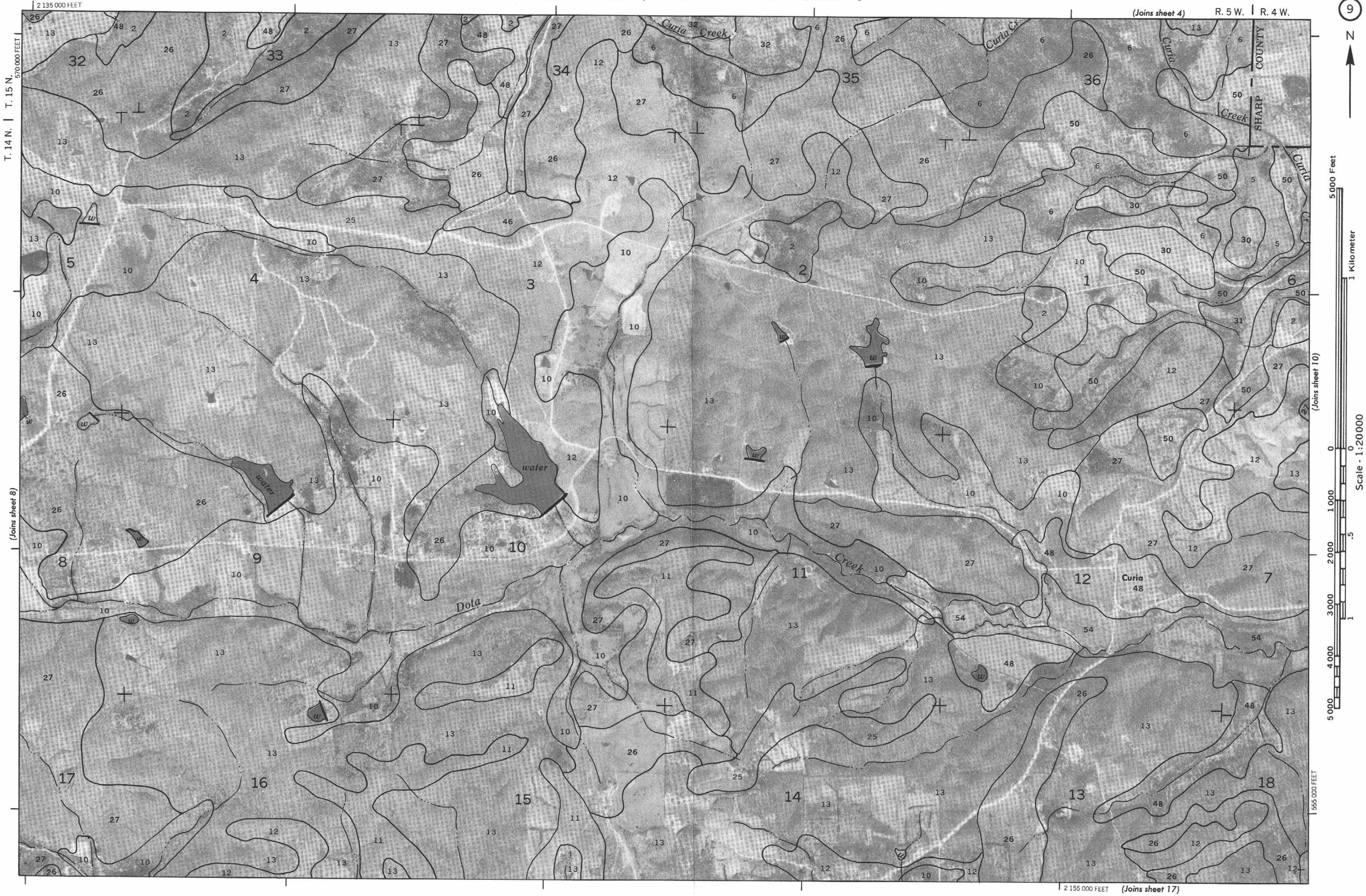

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INDEPENDENCE COUNTY, ARKANSAS NO. 9

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INDEPENDENCE COUNTY, ARKANSAS NO. 11

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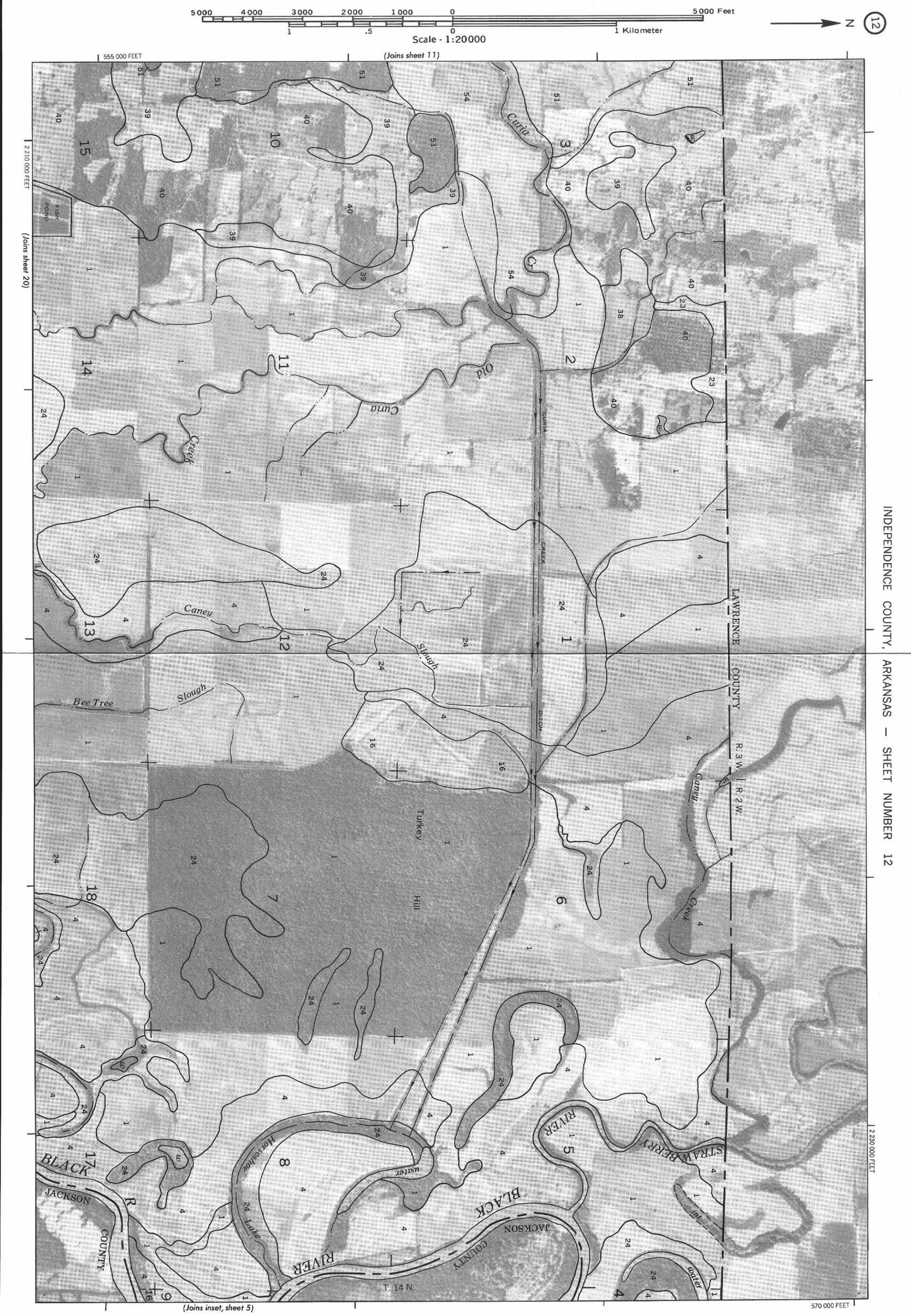
N

Scale - 1:20000

5000 Feet

1 Kilometer



INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 12

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INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 13

INDEPENDENCE COUNTY, ARKANSAS NO. 13

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

(14)

N

R8W. R. 7 W.

(Joins sheet 6)

2 085 000 FEET

550 000 FEET

T. 14 N.

(Joins sheet 15)

5000 Feet

1 Kilometer

Scale - 1:20000

(Joins sheet 13)

540 000 FEET

(Joins sheet 22)

2 065 000 FEET

Branch

Arnold

Mountain

Waugh

Spring

Creek

Dry

Run

Groove Hollow

Limedale Junction

(University of Arkansas Experiment Station) (Livestock and Forestry Branch)

18 17 16 15 14

19 20 21 22 23

30 29 28 27 26

31 32 33 34 35

54

106

69

11

54

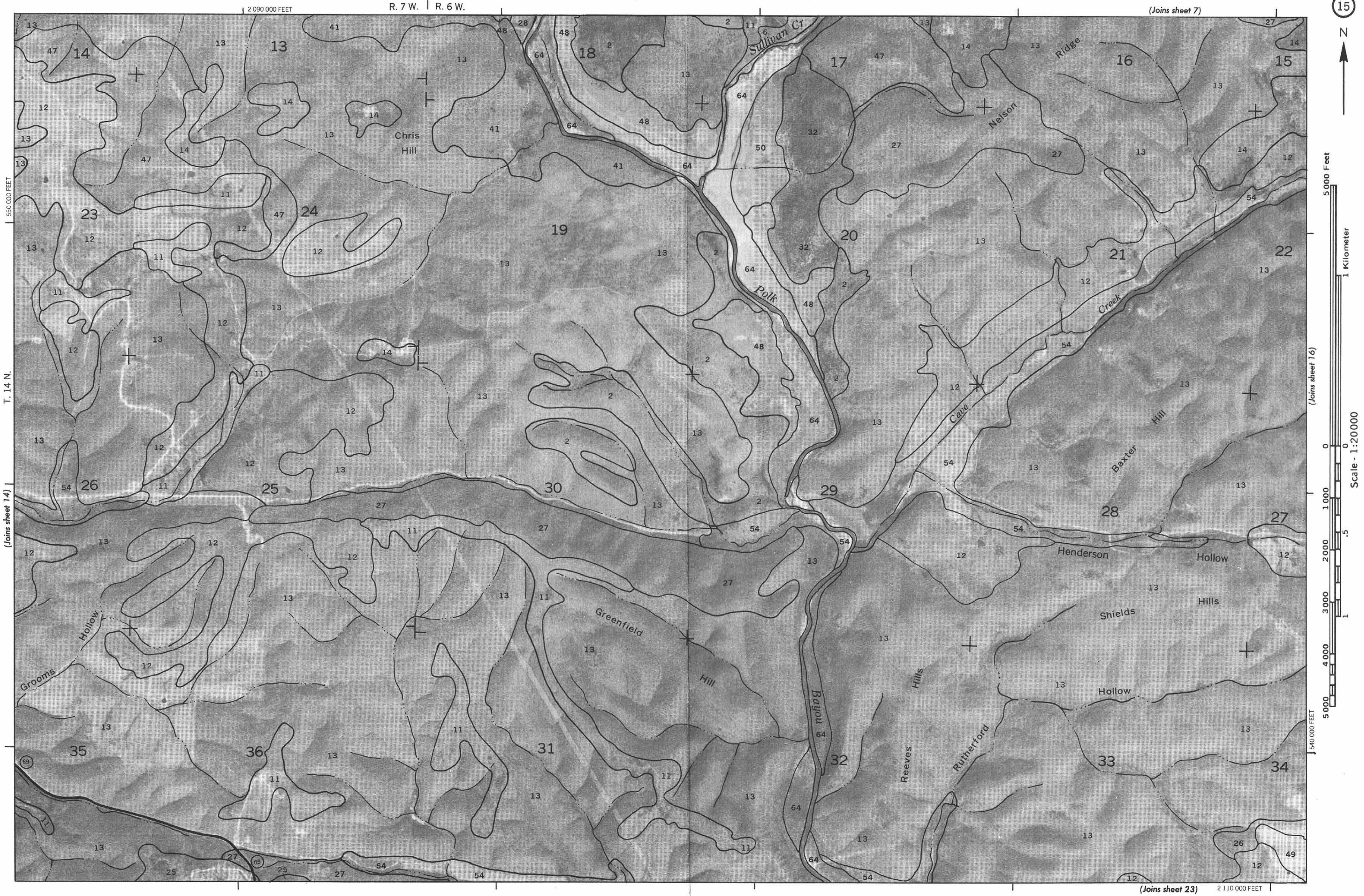
54

54

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS NO. 14

INDEPENDENCE COUNTY, ARKANSAS NO. 15
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 16

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS NO. 16

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 17

INDEPENDENCE COUNTY, ARKANSAS NO. 17
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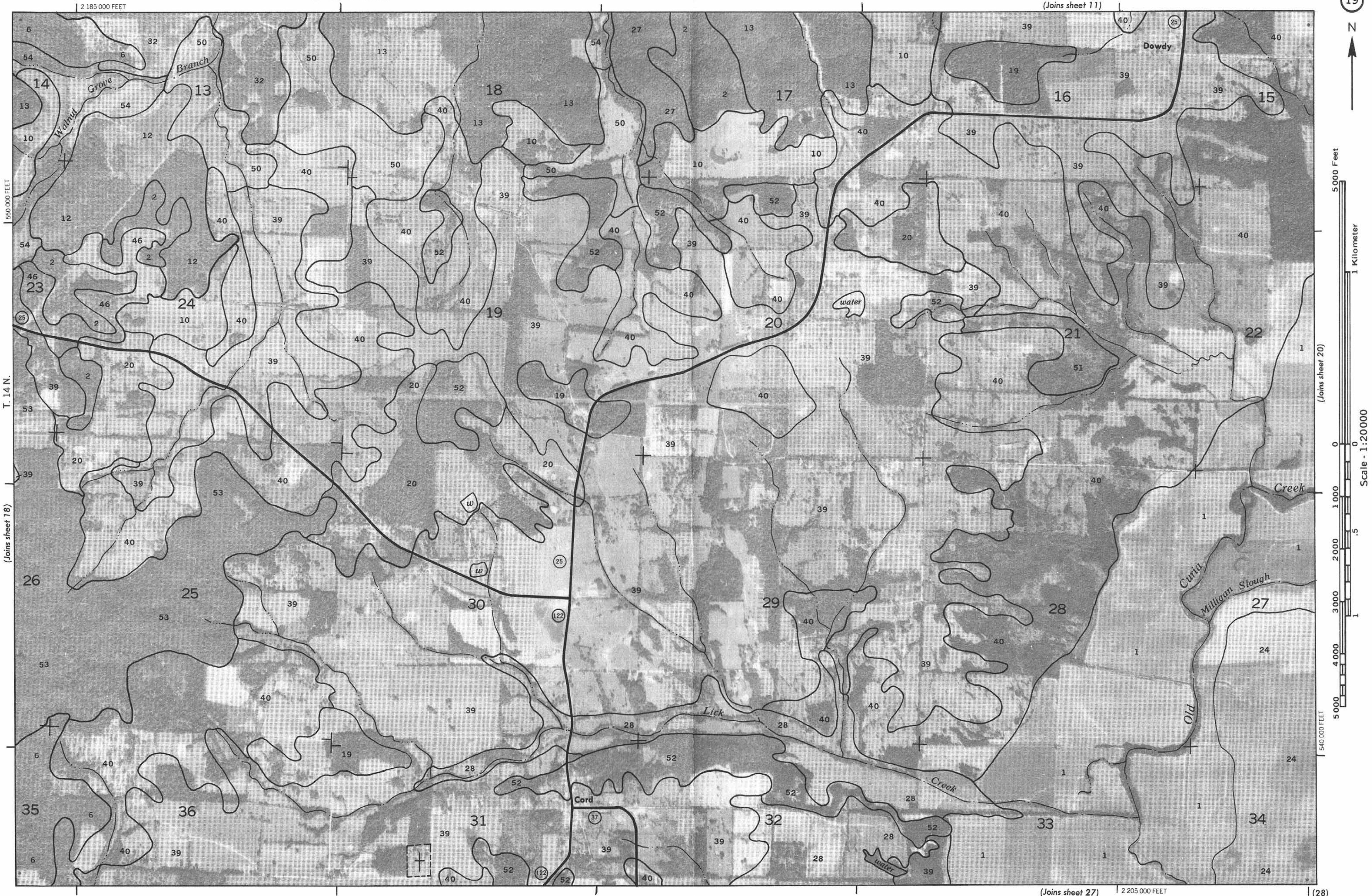

INDEPENDENCE COUNTY, ARKANSAS NO. 19

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INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 21

R. 8 W. | R. 7 W.

(Joins sheet 13)

2 040 000 FEET

535 000 FEET

T. 14 N.

T. 13 N.

Glenn Slough

WHITE RIVER

STONE COUNTY

Spring Branch

Blue

Wright Creek

Ned Hollow

Mose Mountain

Park Hill

Webber Spring Branch

Missouri Pacific R.R.

O'Neal Creek

Betsey Gill Creek

Harmon Creek

O'Neal

(Joins sheet 22)

(Joins sheet 29)

2 060 000 FEET

525 000 FEET

5 000 Feet

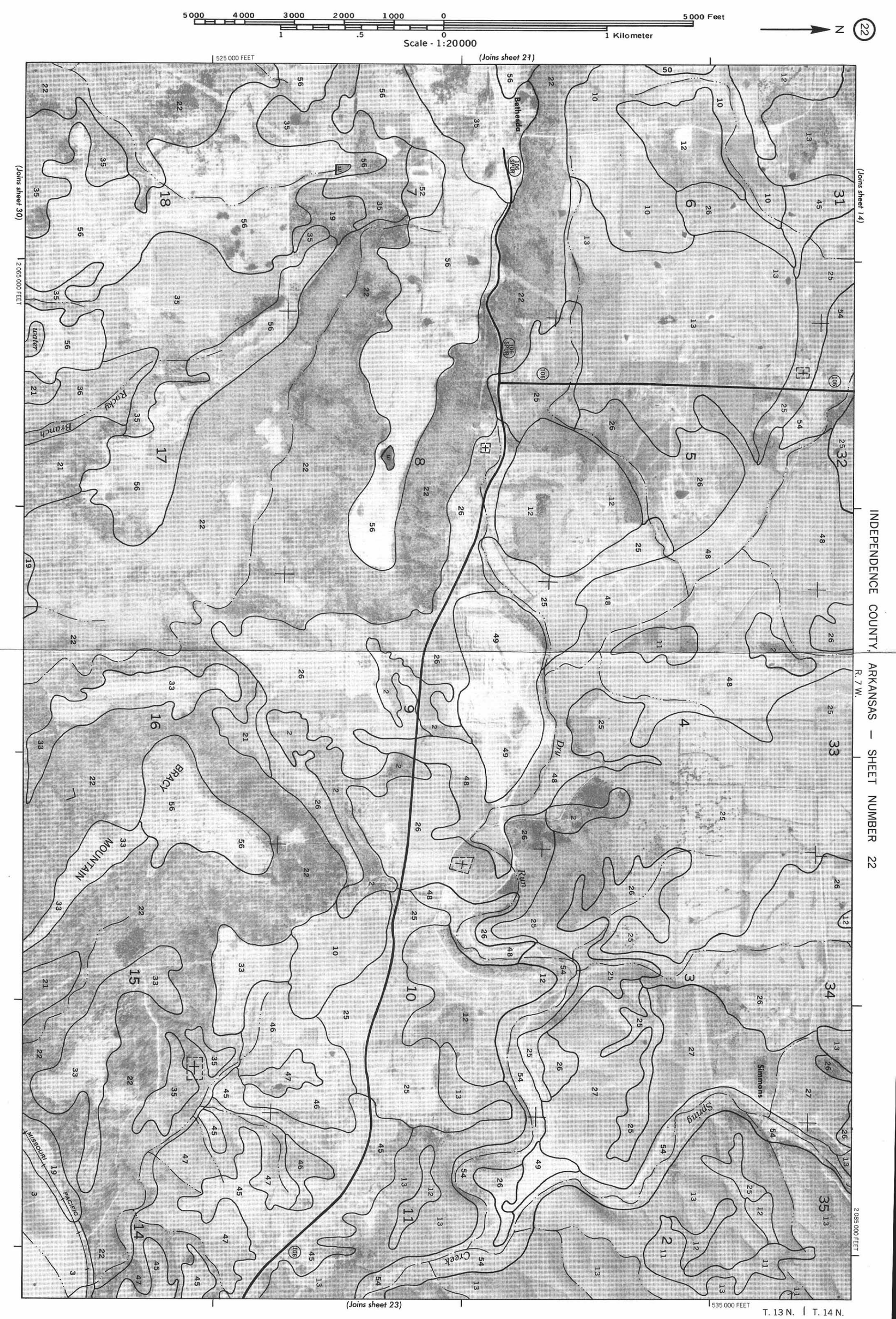
1 Kilometer

Scale - 1:20000

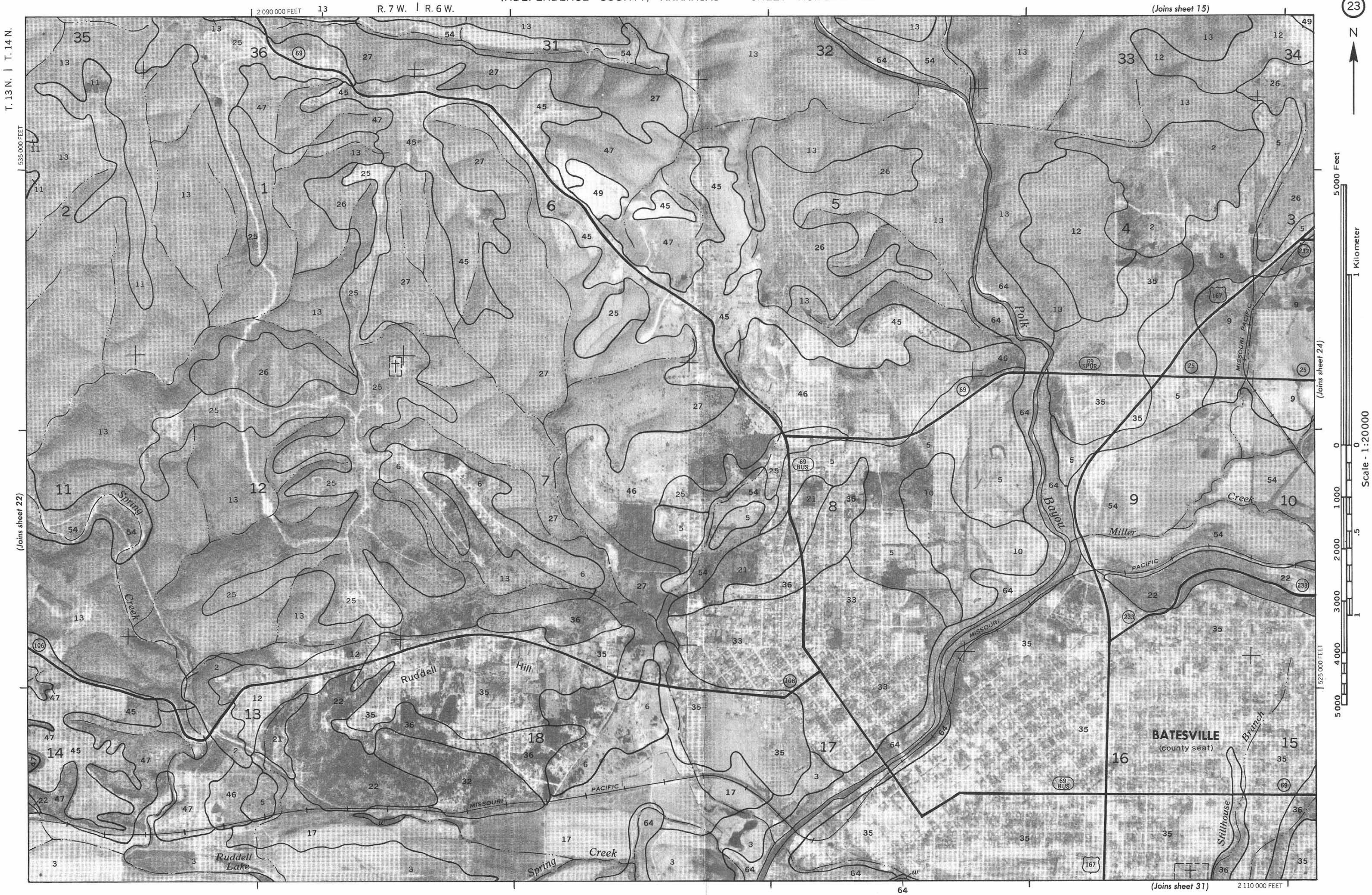
N

INDEPENDENCE COUNTY, ARKANSAS NO. 21

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



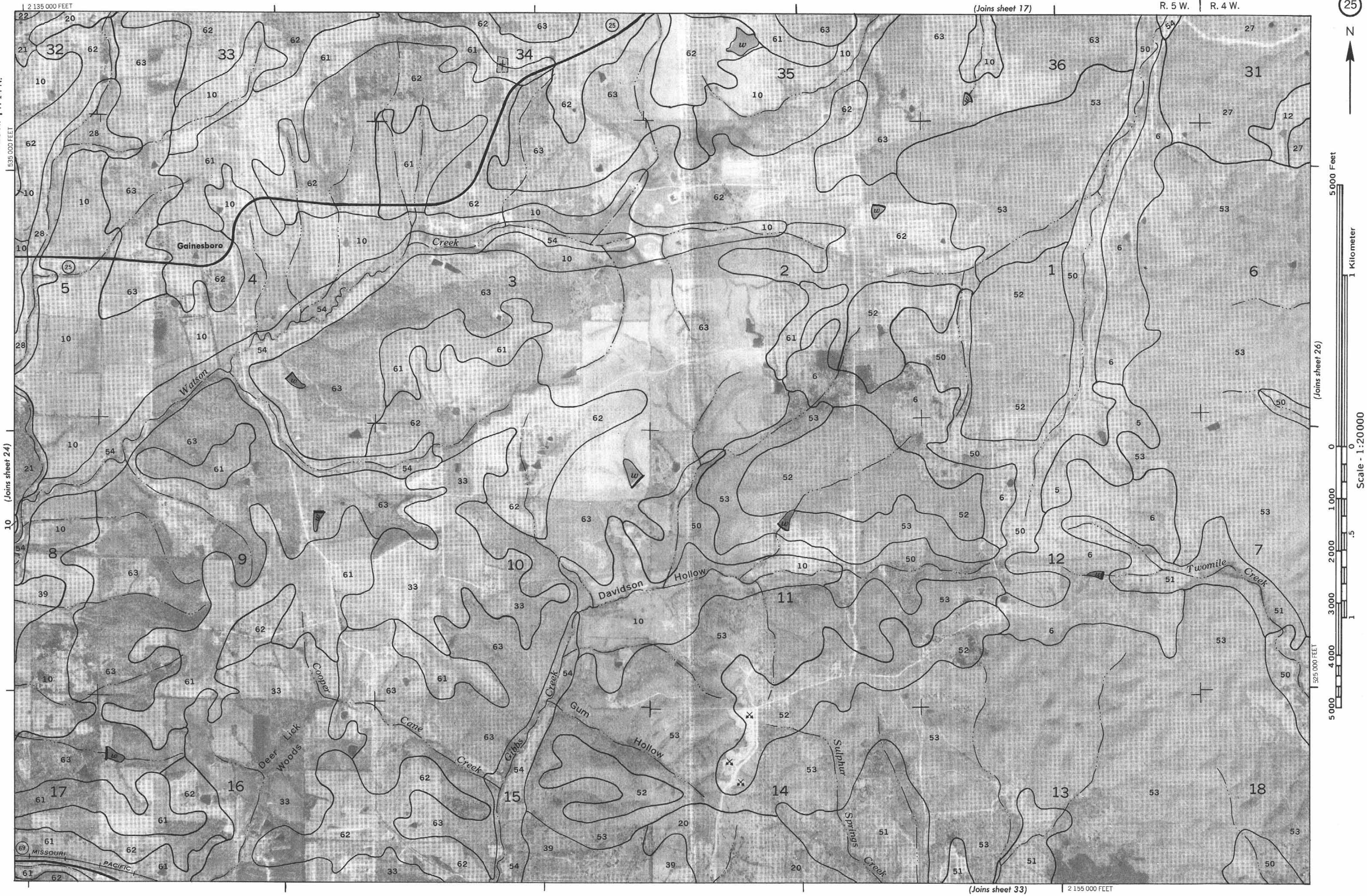
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



INDEPENDENCE COUNTY, ARKANSAS NO. 23

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



INDEPENDENCE COUNTY, ARKANSAS NO. 25

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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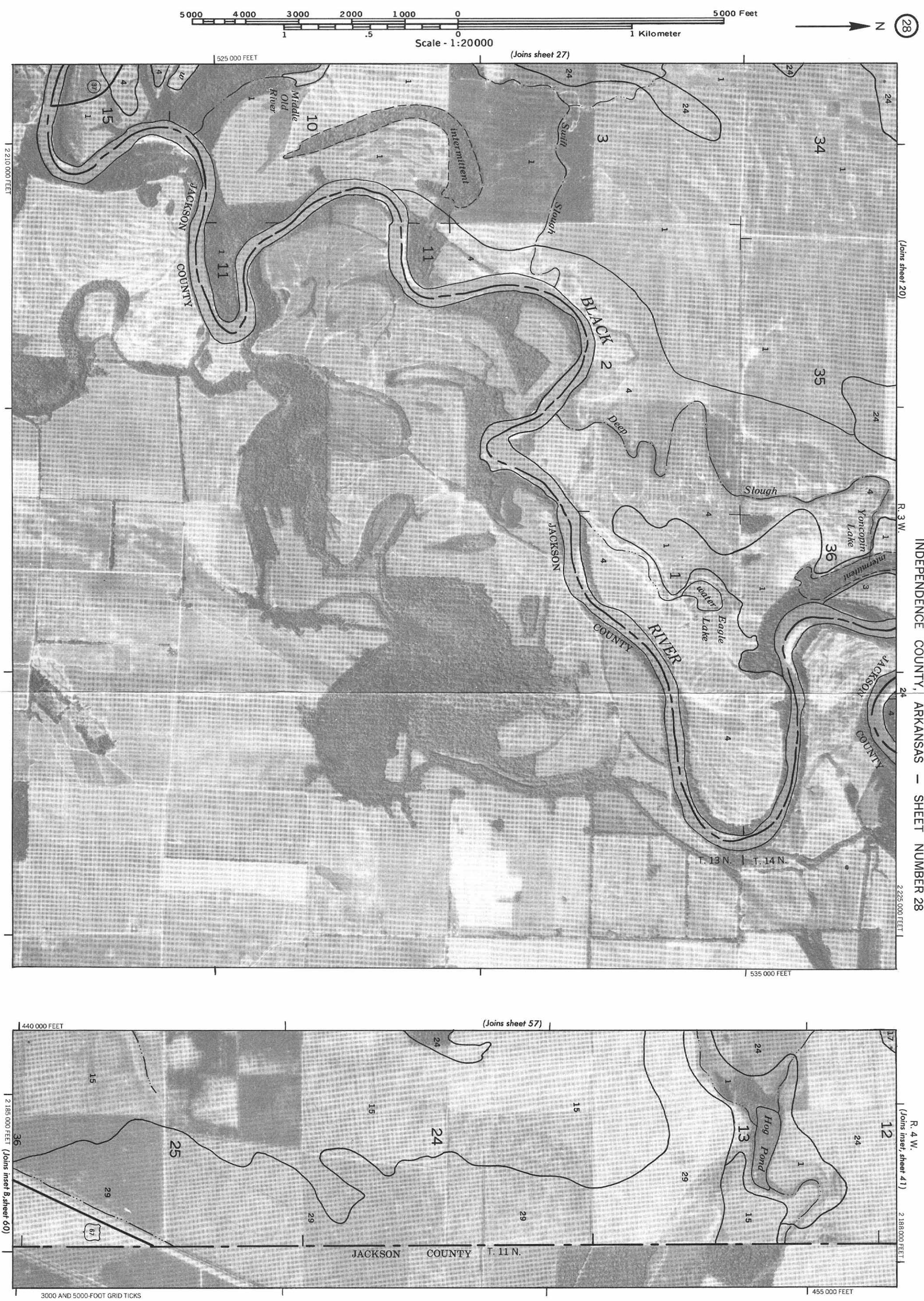
INDEPENDENCE COUNTY, ARKANSAS NO. 26

INDEPENDENCE COUNTY, ARKANSAS NO. 27

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 27



INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 28

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS—SHEET NO. 29
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

2 040 000 FEET

520 000 FEET

R. 8 W. | R. 7 W.

(Joins sheet 21)

29

N

Harmontown

STONE COUNTY

MISSOURI PACIFIC

WHITE RIVER

Bersey Gill Creek

Foushee Island

Foushee Slough

Mountain Round

Hollow

Pat

T. 13 N.

(Joins sheet 30)

5 000 Feet

1 Kilometer

Scale - 1:20000

505 000 FEET

2 060 000 FEET

(Joins inset A, sheet 60)

2 056 000 FEET

575 000 FEET

R. 8 W.

STONE COUNTY

IZARD COUNTY

Lafferty

East

T. 15 N.

(Joins sheet 11)

570 000 FEET

2 060 000 FEET

(Joins sheet 5)

4000 AND 5000-FOOT GRID TICKS

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 30

(30)

N

(Joins sheet 22)

R. 7 W.

2 085 000 FEET

520 000 FEET

T. 13 N.

(Joins sheet 29)

(Joins sheet 31)

505 000 FEET

R. 8 W.

2 065 000 FEET

(Joins sheet 36)

5000 Feet

1 Kilometer

Scale - 1:20000

RIVER

WHITE

MISSOURI

PACIFIC

Earnheart

Island

John Dowell

Hill

Rocky

Branch

Creek

Chinquapin

Goodwin

Slough

Foushee

Slough

Foushee Island

Dean

Mountain

Rocky

Creek

Slate

Hill

water

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 31

R. 7 W. | R. 6 W.

2 090 000 FEET

520 000 FEET

T. 13 N.

(Joins sheet 23)

(Joins sheet 30)

(Joins sheet 37)

2 110 000 FEET

510 000 FEET

(Joins sheet 32)

BATESVILLE (county seat)

WHITE RIVER

Spring Creek

Ruddell Lake

Bayou Polk

Brush Island

Luster Island

Slough

Simpson Branch

Taylor Creek

Greenbrier

Desha

Bryant

Ramsey Hill

Dennison Heights

Jamestown

Alderbrook Creek

Buffalo Creek

BATESVILLE MUNICIPAL AIRPORT

water

31

N

5 000 Feet

1 Kilometer

Scale - 1:20000

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

2 135 000 FEET

520 000 FEET

(Joins sheet 25)

R. 5 W. | R. 4 W.

T. 13 N.

(Joins sheet 32)

(Joins sheet 34)

(Joins sheet 39)

2 155 000 FEET

505 000 FEET

Sulphur Rock

Rutherford

MISSOURI PACIFIC

Hill

Waits

Gibbs

Creek

Sulphur Springs Creek

Mountain

Caldwell

Creek

Big Creek

Waldrip Br

Thompson Creek

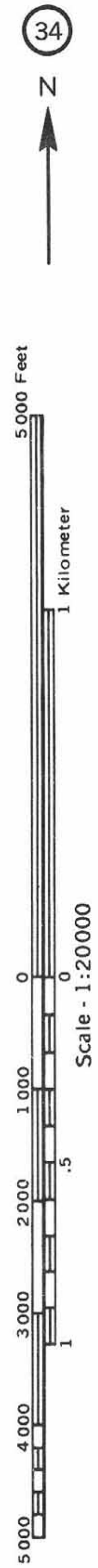
N

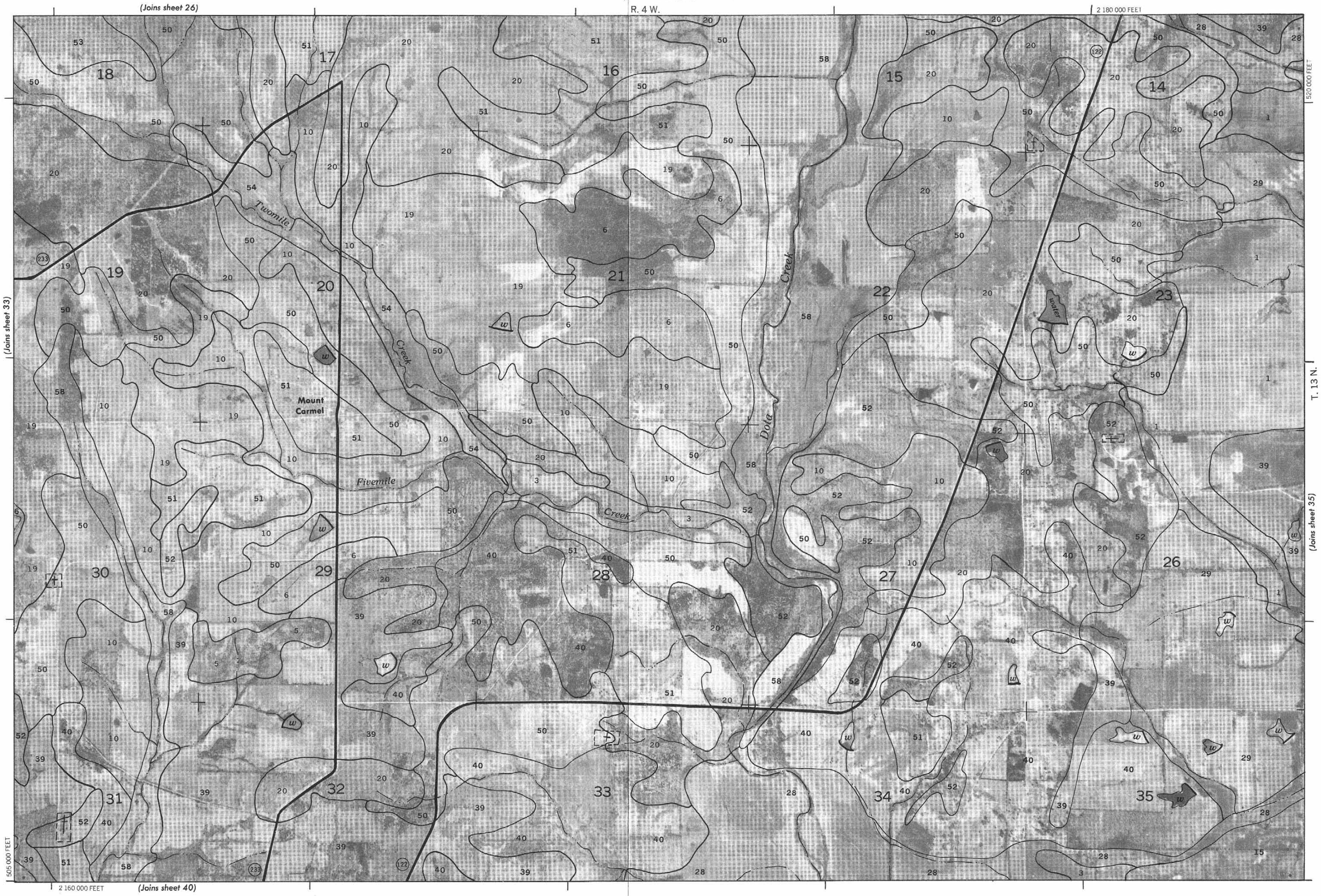
5 000 Feet

1 Kilometer

Scale - 1:20000

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 34





This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 35

R. 4 W. | R. 3 W.

2 185 000 FEET

520 000 FEET

T. 13 N.

(Joins sheet 27)

(Joins sheet 34)

(Joins sheet 41)

(Joins sheet 41)

2 205 000 FEET

505 000 FEET

35

N

Scale - 1:20000

5000 Feet

1 Kilometer

Lower Curia Lake

Goose Lake

Lower Old River

Whisnant Old River

Intermittent

Little Cow Pond

Fish Lake

Dota Old River

Carter Creek

BLACK RIVER

JACKSON COUNTY

13 14 15 16 17 18 19 20 21 23 24 25 26 29 30 31 32 35 36

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service; and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS NO. 35

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 37

37

N

2 090 000 FEET

505 000 FEET

R. 7 W. | R. 6 W.

T. 12 N. | T. 13 N.

(Joins sheet 31)

(Joins sheet 36)

(Joins sheet 38)

(Joins sheet 43)

2 110 000 FEET

290 000 FEET

Buffalo Creek

Greenbrier Creek

Jonestown

Inman Creek

Sheriff Springs Branch

Muddy Double Branch

Jamestown

McHue

Flynn Hollow

Tivis

Cobb Mountain

Canel Branch

Creek

South Side

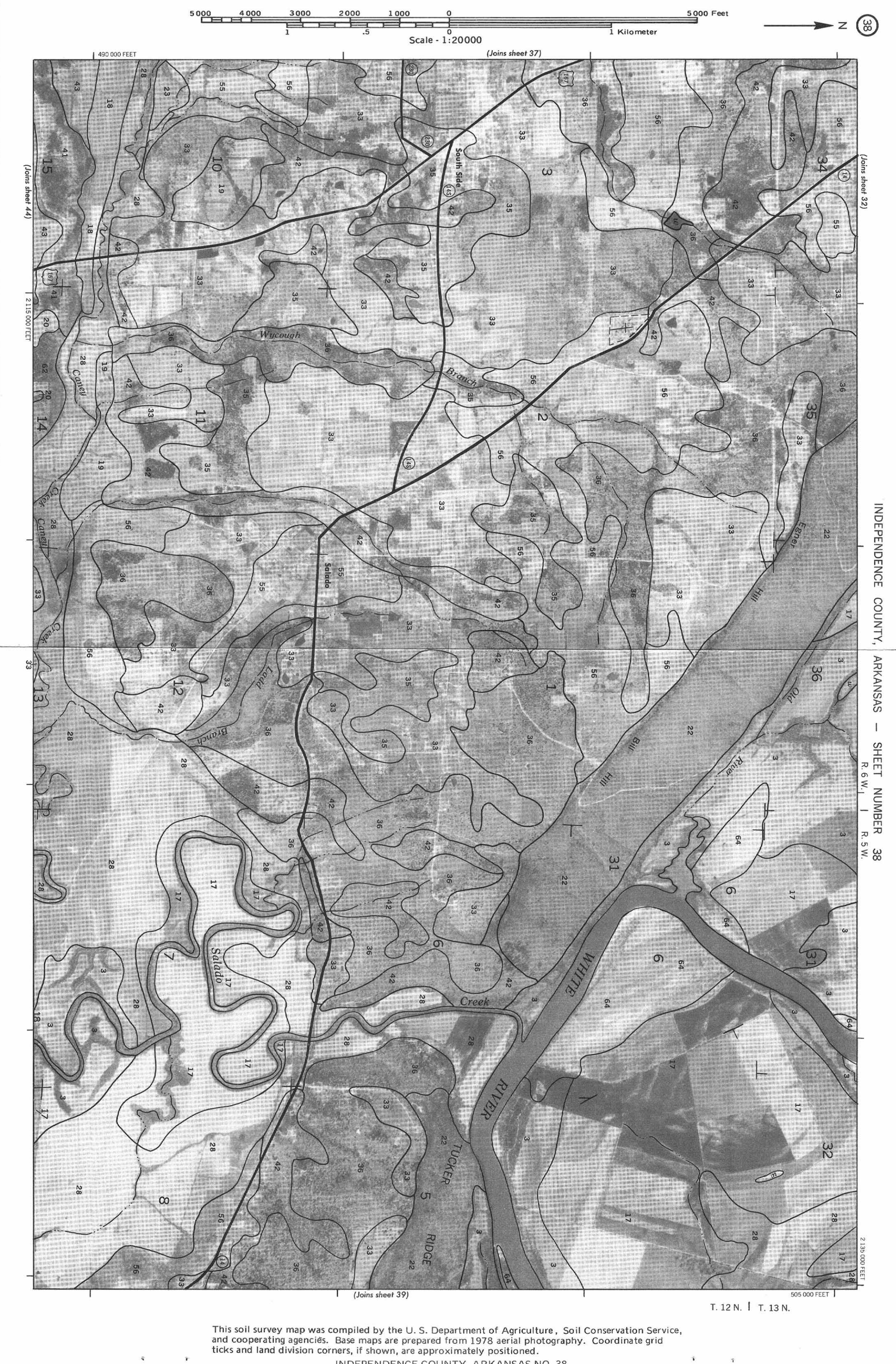
5000 Feet

1 Kilometer

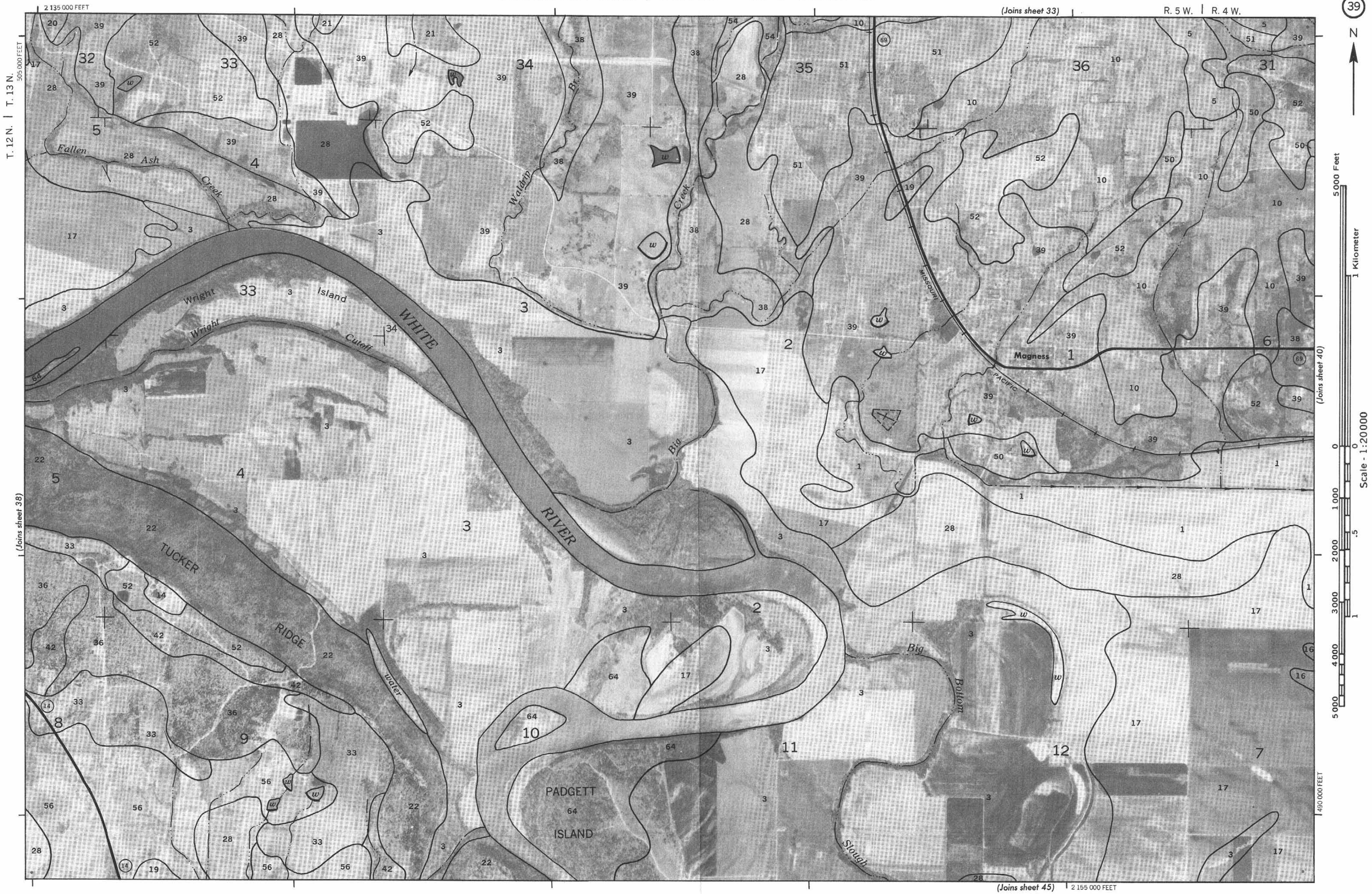
Scale - 1:20000

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS NO. 37



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



INDEPENDENCE COUNTY, ARKANSAS NO. 39

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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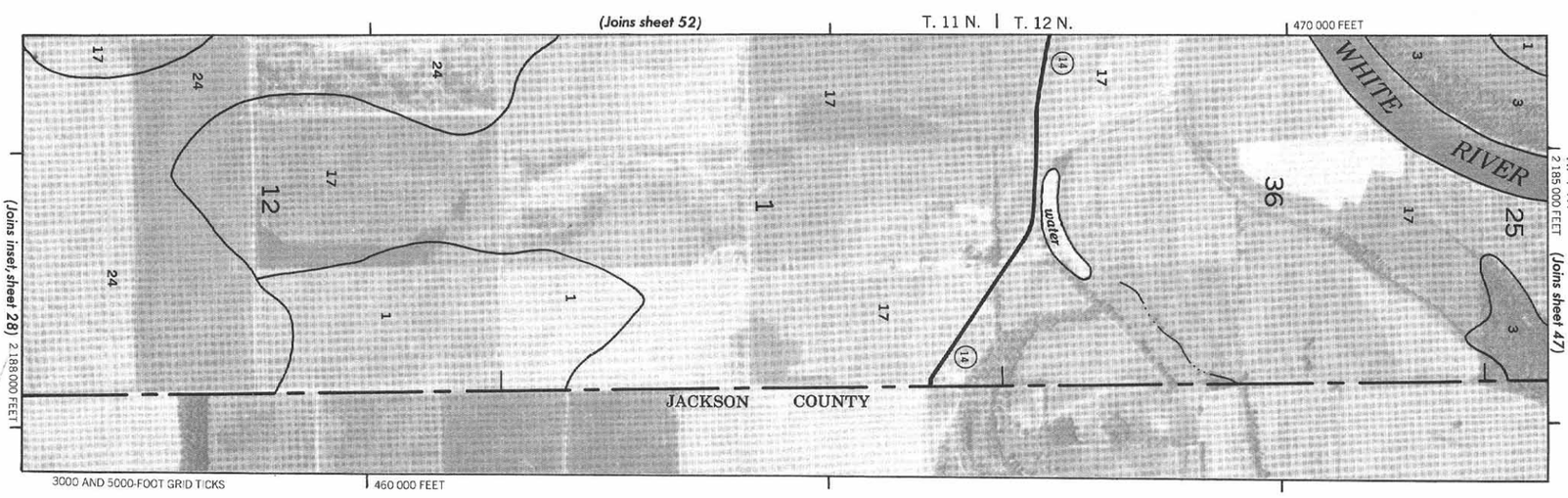
INDEPENDENCE COUNTY, ARKANSAS NO. 41

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



5000 4000 3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000

N

41

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 42

42

N

(Joins sheet 36)

R. 7 W.

2 085 000 FEET

485 000 FEET

T. 12 N.

(Joins sheet 43)

2 065 000 FEET

(Joins sheet 48)

475 000 FEET

5 000 Feet

1 Kilometer

Scale - 1:20000

CLEBURNE COUNTY

Bailey Hollow

Grassy Creek

Yellow Branch

JAMESTOWN MOUNTAIN

Caney Creek

Piney Creek

Log Creek

Hole Branch

Blue Round Mountain

Salado Creek

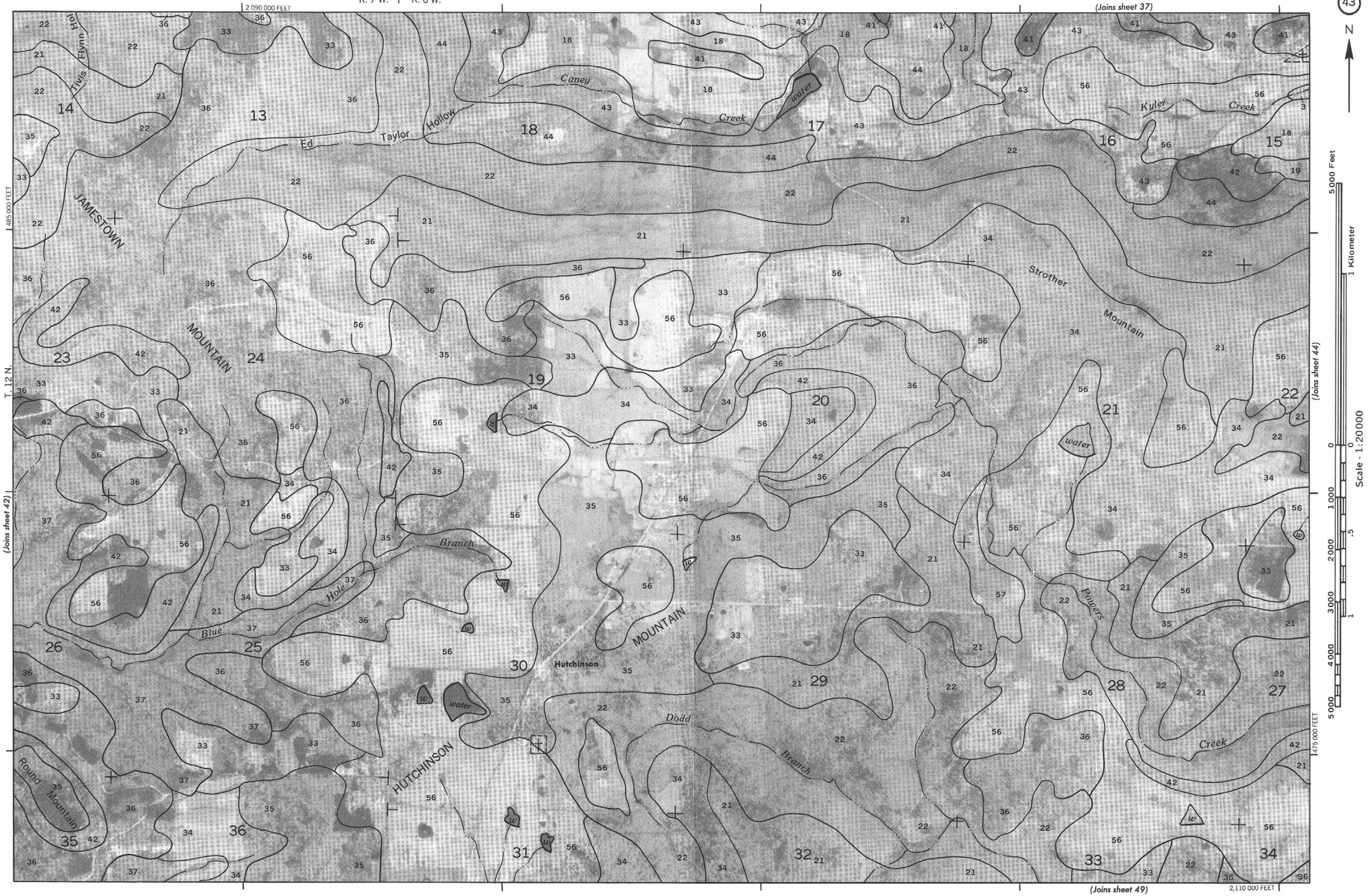
18 17 16 15 14

19 20 21 22 23

30 29 28 27 26

31 32 33 34 35

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 44

44

N

R. 6 W. | R. 5 W.

2 135 000 FEET

(Joins sheet 38)

(Joins sheet 43)

(Joins sheet 45)

(Joins sheet 50)

2 115 000 FEET

485 000 FEET

475 000 FEET

T. 12 N.

Scale - 1:20000

5000 Feet

1 Kilometer

Caney Cr

Caney Creek

Salado Cr

Kyler

Creek

Possum

Creek

Mountain

Neal

Creek

Cedar

Creek

Powers

Creek

Salado

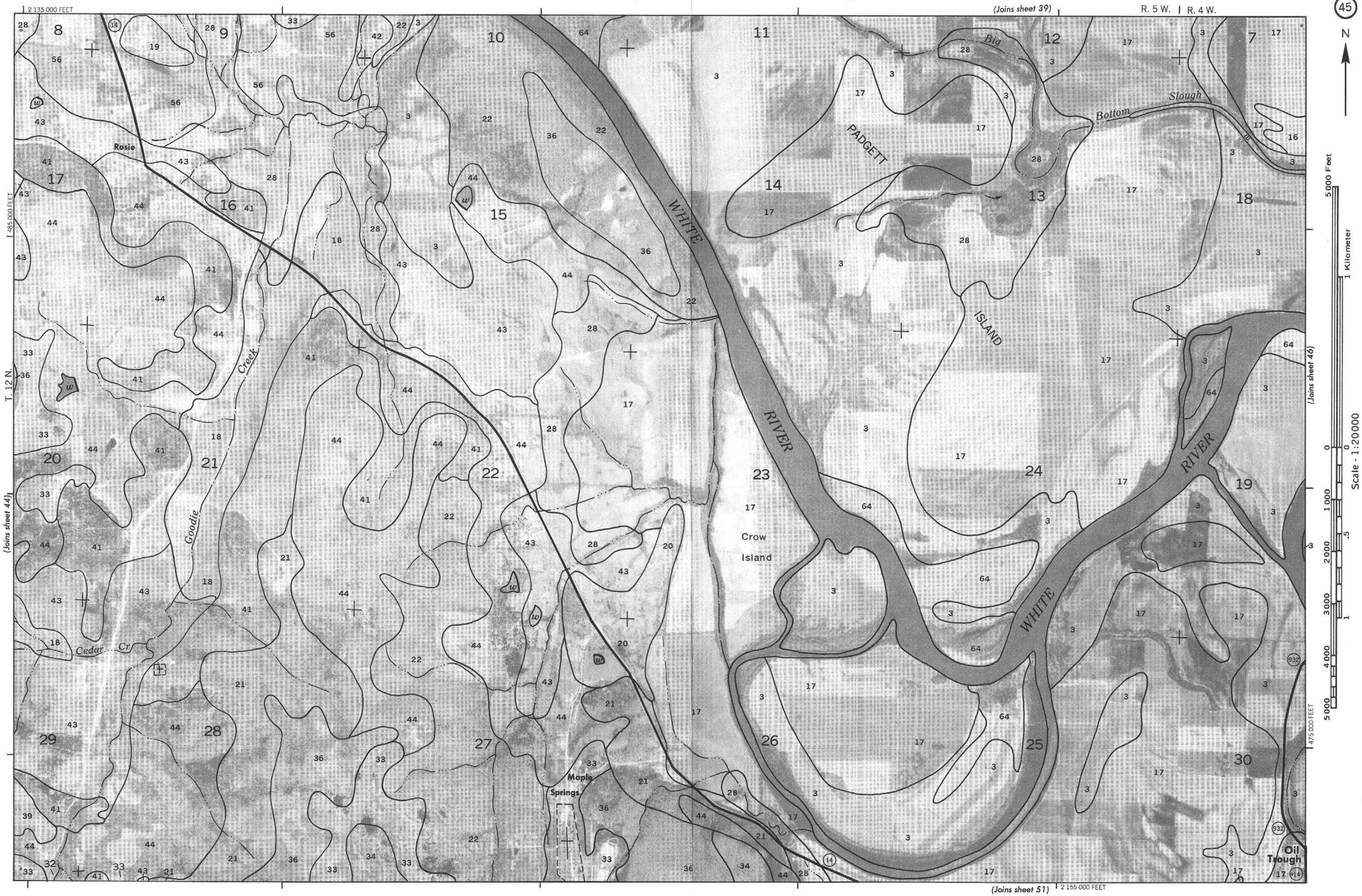
15 14 13 18 17

22 23 24 19 20

27 26 25 30 29

34 35 36 31 32

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



INDEPENDENCE COUNTY, ARKANSAS NO. 45

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 46

46

N

5 000 Feet

1 Kilometer

Scale - 1:20000

(Joins sheet 40)

R. 4 W.

2 180 000 FEET

485 000 FEET

T. 12 N.

(Joins sheet 45)

475 000 FEET

2 160 000 FEET

(Joins sheet 52)

(Joins sheet 47)

Slough

Mud

Creek

Bottom

Big

SWAN

LAKE

DRAINAGE

DITCH

Round

Lake

water

WHITE

RIVER

Hulsey

Bend

Island

Pleasant

Oil

Trough

Wall

Lake

Bear

Walton

Slough

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 47

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 48

(48)

N

(Joins sheet 42)

R. 7 W.

2 085 000 FEET

T. 11 N. | T. 12 N.

470 000 FEET

460 000 FEET

CLEBURNE COUNTY

Caney Creek

Piney Log Creek

Salado Creek

Wagon Wheel Creek

Mitchell Branch

Floral

(Joins sheet 49)

2 065 000 FEET (Joins sheet 53)

5,000 Feet

1 Kilometer

Scale - 1:20000

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS NO. 49
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 51

51

2 135 000 FEET

(Joins sheet 45)

R. 5 W. | R. 4 W.

N

470 000 FEET

T. 11 N. | T. 12 N.

Goodie Creek

Creek

Fife Slough

Oil Trough

Brown Lake

Village Creek

Dog Lick Branch

Dopariee Creek

(Joins sheet 50)

(Joins sheet 52)

(Joins sheet 56)

2 155 000 FEET

460 000 FEET

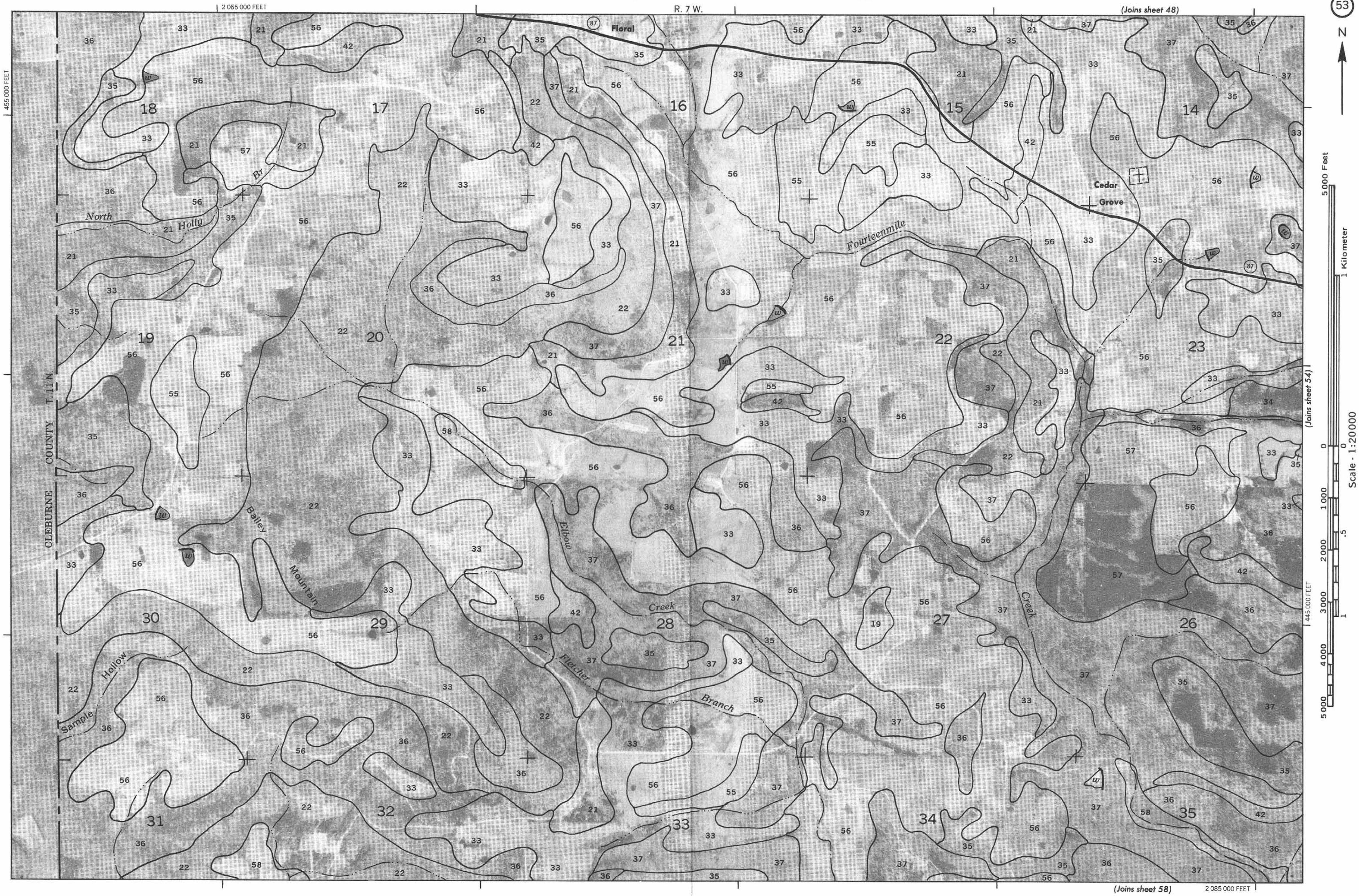
5 000 Feet

1 Kilometer

Scale - 1:20000

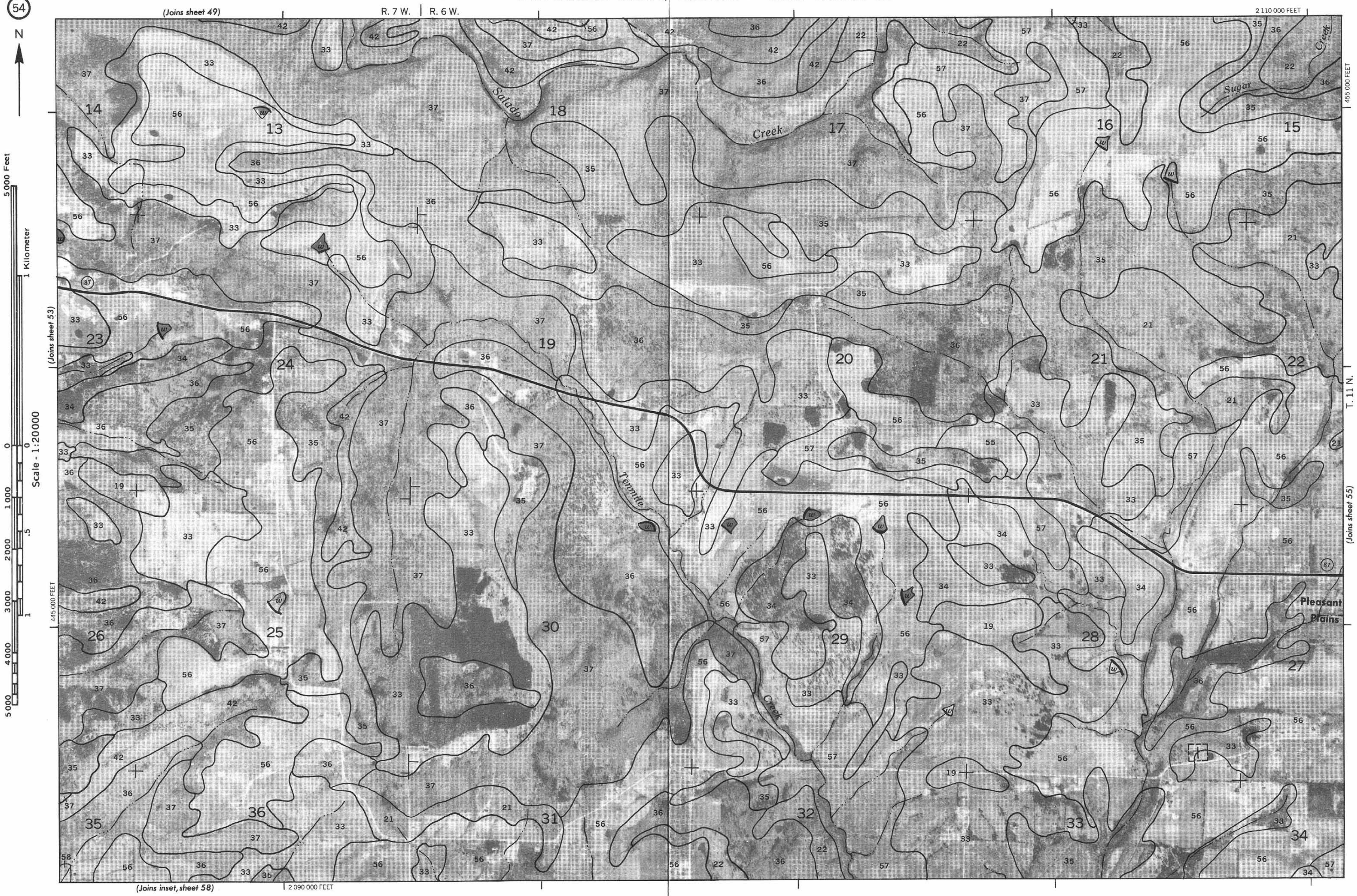
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

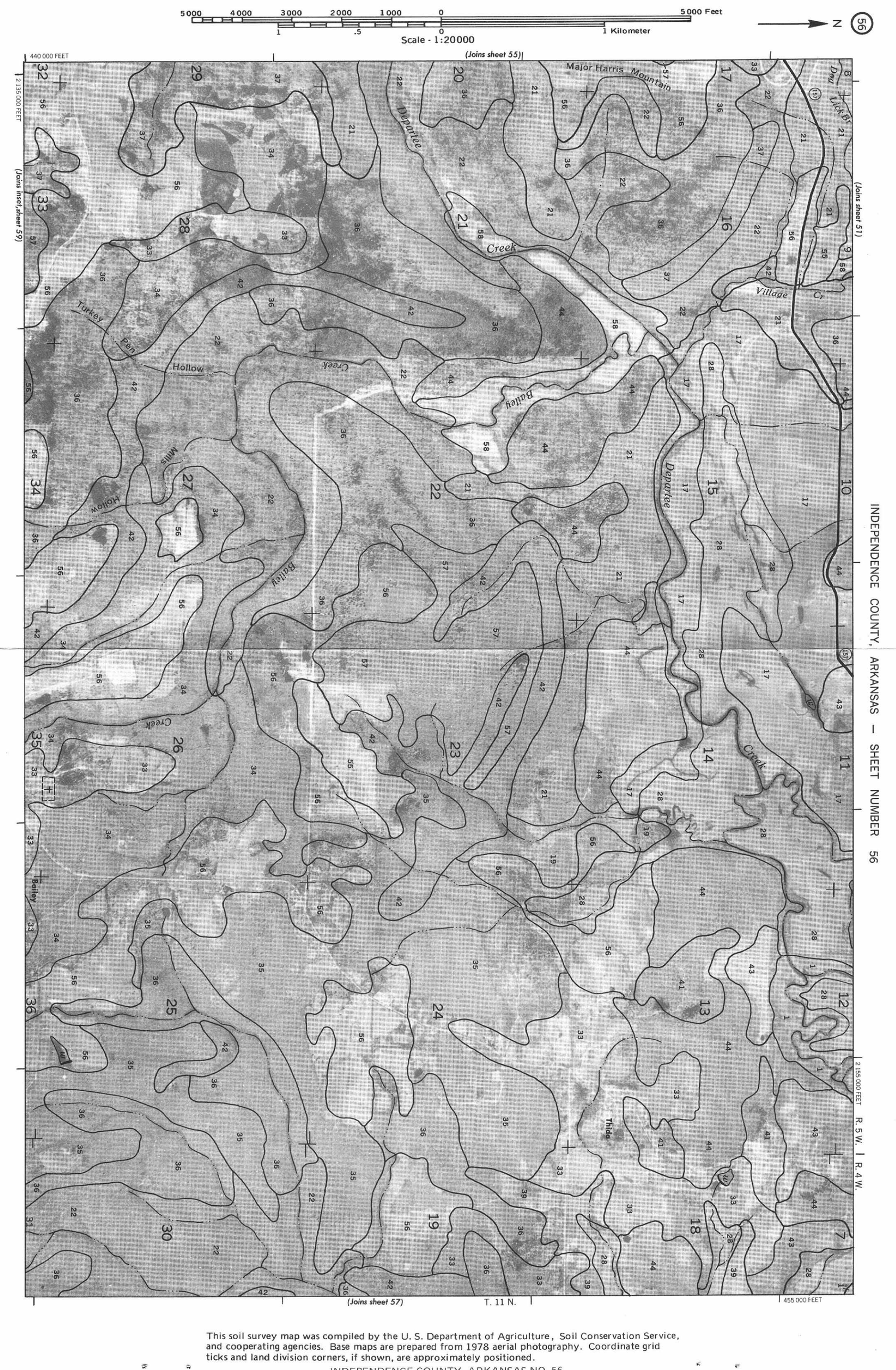
INDEPENDENCE COUNTY, ARKANSAS NO. 53



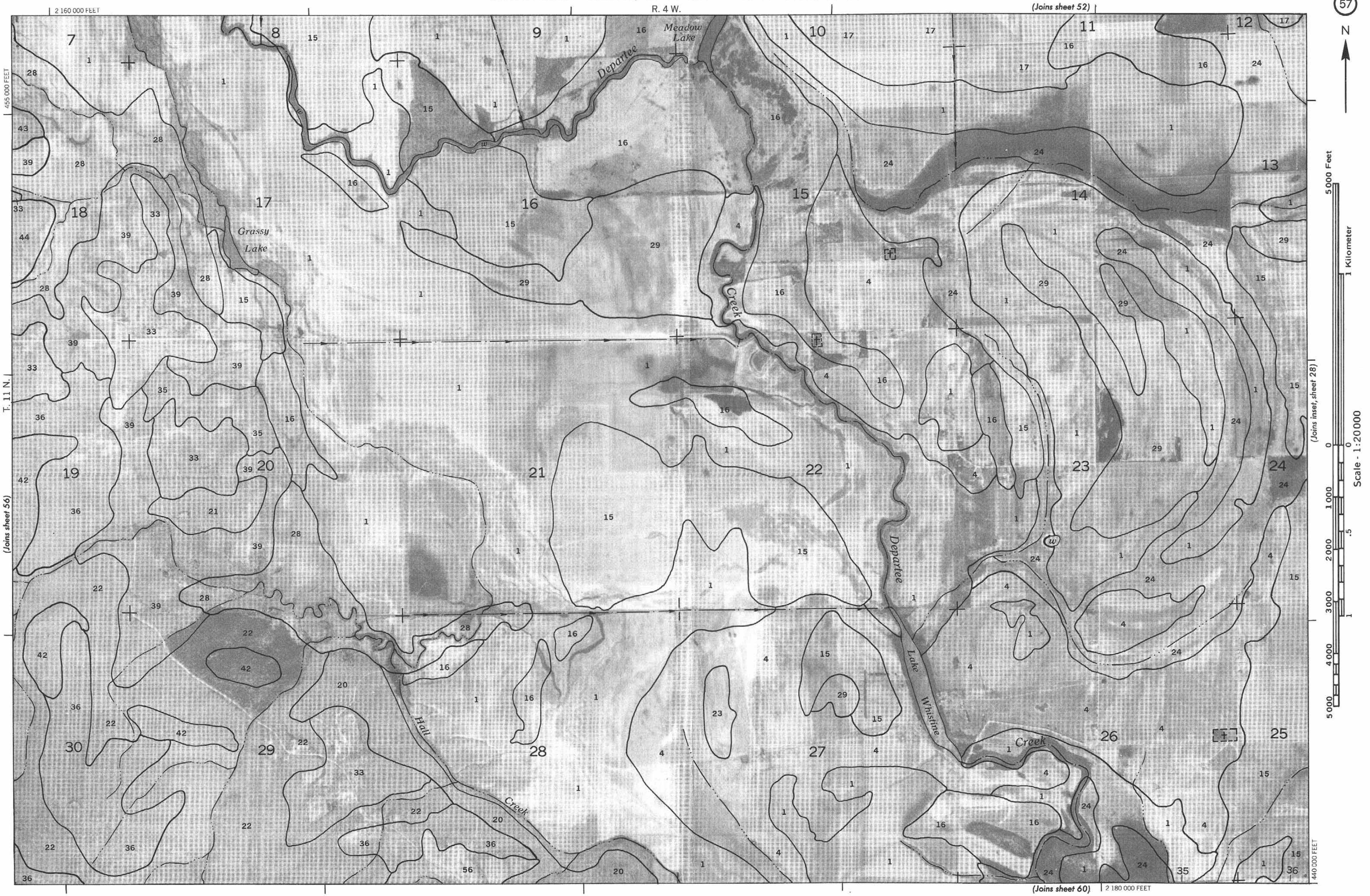
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS NO. 55

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 58

58

N

Scale - 1:20000

5000 Feet 0 1 Kilometer 0

1 000 2 000 3 000 4 000 5 000

.5 1

(Joins sheet 53)

R. 7 W.

2 085 000 FEET

2 065 000 FEET

435 000 FEET

440 000 FEET

T. 11 N.

(Joins lower left)

CLEBURNE COUNTY

WHITE COUNTY

Big Creek

Elgin Creek

Fourteenmile Cr.

R. 7 W. | R. 6 W.

(Joins sheet 54)

2 110 000 FEET

2 090 000 FEET

436 000 FEET

440 000 FEET

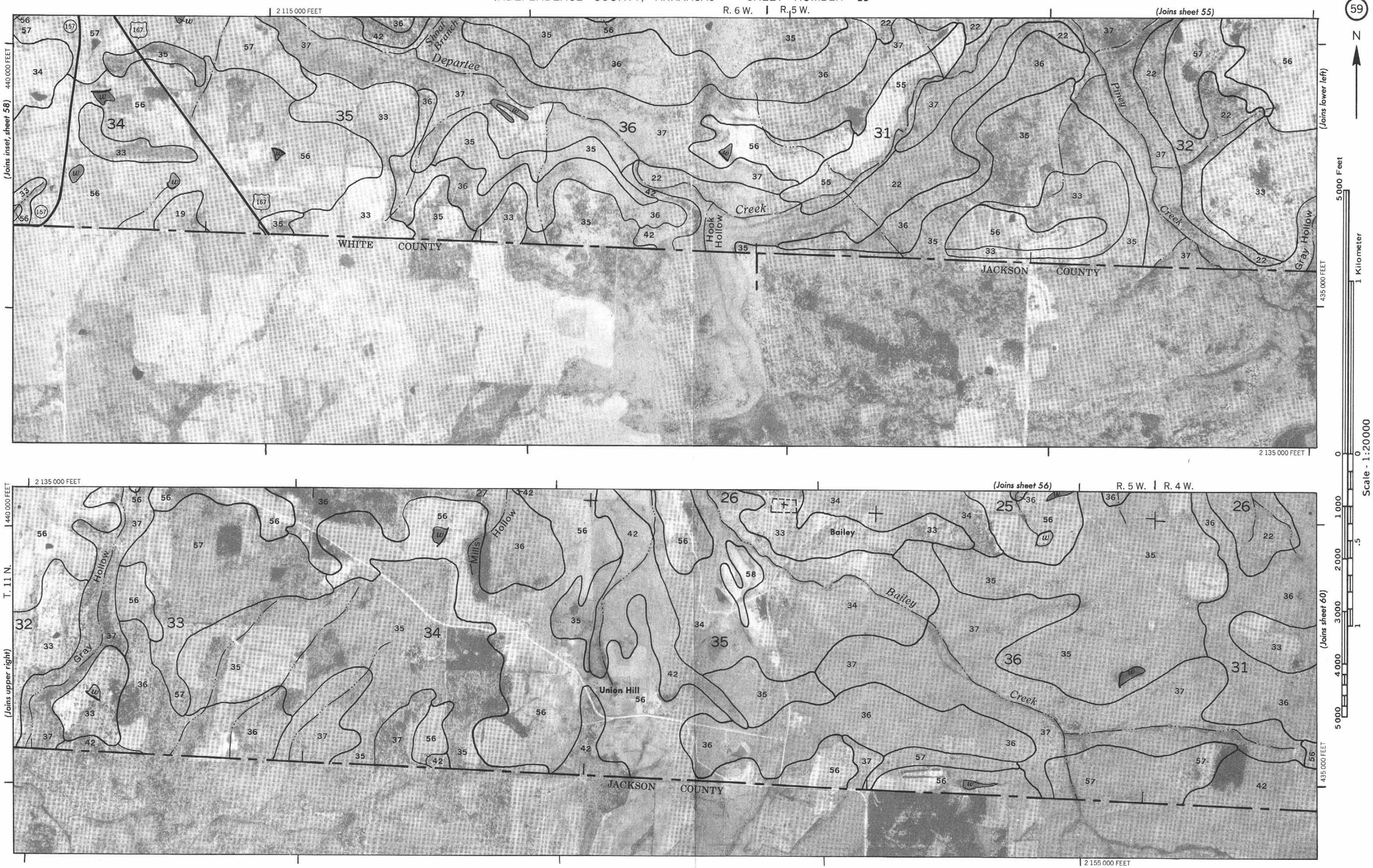
(Joins upper right)

(Joins sheet 59)

Tennile Creek

4000 AND 5000 FOOT GRID TICKS

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



INDEPENDENCE COUNTY, ARKANSAS NO. 59

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS — SHEET NUMBER 60

60

N

5000 Feet

1 Kilometer

Scale - 1:20000

(Joins sheet 57)

(Joins inset, sheet 59)

R. 4 W.

2 180 000 FEET

440 000 FEET

T. 11 N.

(Joins inset B, lower left)

Hall Creek

Blue Creek

Blue Creek

Departee Creek

JACKSON COUNTY

INSET A

R. 8 W.

(Joins sheet 29)

2 060 000 FEET

(Joins sheet 36)

505 000 FEET

T. 13 N.

STONE COUNTY

500 000 FEET

Kettle Hollow

Womack Spring Hollow

CLEBURNE COUNTY

425 000 FEET

2 050 000 FEET

INSET B

R. 4 W.

(Joins inset, sh 28)

2 188 000 FEET

T. 11 N.

(Joins upper right)

435 000 FEET

PACIFIC

MISSOURI

JACKSON COUNTY

2 185 000 FEET

3000 AND 5000-FOOT GRID TICKS

2 160 000 FEET

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1978 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEPENDENCE COUNTY, ARKANSAS NO. 60